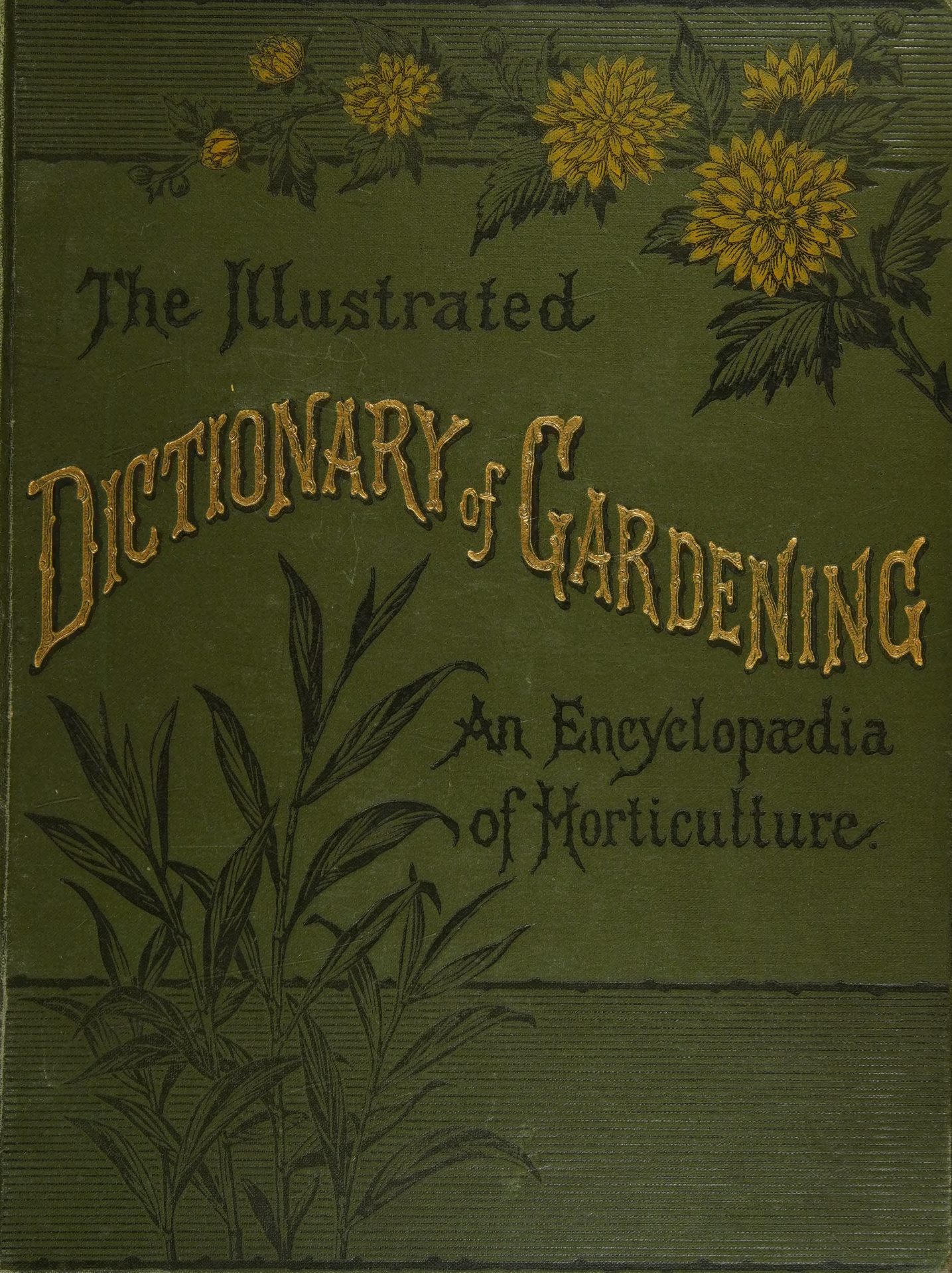

The Illustrated
DICTIONARY of GARDENING
An Encyclopædia
of Horticulture.

SANDEMAN PUBLIC LIBRARY
PERTH
WITHDRAWN

Class, 635·03

Accession Number, 19523

113
635.03

THE ILLUSTRATED

DICTIONARY OF GARDENING.

Digitized by the Internet Archive
in 2026

https://archive.org/details/illustrateddicti0001geor

THE

ILLUSTRATED

DICTIONARY OF GARDENING,

A PRACTICAL AND SCIENTIFIC

Encyclopædia of Horticulture

FOR

GARDENERS AND BOTANISTS.

EDITED BY

GEORGE NICHOLSON, A.L.S.,

Curator, Royal Botanic Gardens, Kew.

Assisted by Professor J. W. H. TRAIL, A.M., M.D., F.L.S., in the parts relating to Insects, Fungi, Plant Structure, Horticultural Chemistry, &c.; and J. GARRETT in the Fruit, Vegetable, and General Garden Work portions.

Vol. I.—A to E.

SANDSMAN
PUBLIC LIBRARY

London:

L. UPCOTT GILL, 170, STRAND, W.C.

635.03

19523

LONDON: PRINTED BY A. BRADLEY, 170, STRAND.

PREFACE.

THE ILLUSTRATED DICTIONARY OF GARDENING aims at being the best and most complete Work on Gardening and Garden Plants hitherto published. The aim is, indeed, a high one; but the Publisher, whose taste for Flowers has rendered the production a labour of love, has, on his part, spared no expense that the Typography and Illustrations should be of a very high class. It is to be hoped that earnest efforts to attain accuracy, by consulting the best Authorities, combined with no small amount of original research, have contributed to render the *matter* of the Work not unworthy of the *form* in which it is presented to the reader. The large number of Illustrations is an important feature; and it is believed that the figures quoted, and the references given to various works — in which more detailed information is contained than is desirable, or, indeed, possible, in these pages, on account of space — will greatly add to the interest and value of the work. Considerable trouble has been taken in revising the tangled synonymy of many genera, and in clearing up, as much as possible, the confusion that exists in garden literature in connection with so many plants, popular and otherwise. In the matter of generic names, Bentham and Hooker's recently-completed "Genera Plantarum" has, with few exceptions, been followed; that work being the one which will, for a long time to come, undoubtedly remain the standard authority on all that relates to generic limitation. With regard to the nomenclature of species, I have endeavoured to consult the latest and most trustworthy Monographs and Floras, and to adopt the names in accordance with them. Now and then, certain plants are described under their common garden names; but they will, in such cases, be also found mentioned under the genus to which they really belong. A case in point may be cited: *Anœctochilus Lowii* is given under *Anœctochilus*, but the name it must now bear is *Dossinia*, and a reference to that genus will explain matters pretty fully, as far as the present state of knowledge goes.

I am greatly indebted to Professor J. W. H. Trail, M.D., F.L.S., &c., for his valuable contributions on Insects, Fungi, and Diseases of Plants, branches of science in which he has long been specially interested, and in which he is an undoubted authority.

Mr. J. Garrett, of the Royal Gardens, Kew, late of the Royal Horticultural Society's Gardens, is responsible for Fruit and Vegetable Culture, for most of what appertains to Florists' Flowers, and for General Gardening Work. For information on many special subjects — Begonias may be cited as an example — I am obliged for much assistance to Mr. W. Watson, also of the Royal Gardens, Kew; in fact, the article *Begonia*, in its entirety, was written by him. Mr. W. B. Hemsley, A.L.S., has, throughout, given me aid and advice; and I have to acknowledge constant help from several other colleagues.

The Rev. Percy W. Myles, M.A., has taken no little trouble in working out the correct derivations of very many of the Generic Names; unfortunately, in a number of instances, lack of time prevented me from obtaining the benefit of his knowledge. I have to record my gratitude for help in so difficult a task, this special study being one to which Mr. Myles has paid much attention.

GEORGE NICHOLSON.

Royal Gardens, Kew.

REFERENCE TO ILLUSTRATIONS OF PLANTS OTHER THAN THOSE FIGURED IN THIS WORK.

IT has been suggested, by an eminent Authority, that many readers would be glad to be informed where reliable Illustrations could be found of those Plants which are not figured in this Work. To meet this want, references to the Figures in Standard Authorities have been given, the titles of the Works referred to being, for economy of space, abbreviated as follows:

A. B. R. .. Andrews (H. C.). Botanist's Repository. London, 1799-1811. 10 vols. 4to.

A. E. .. .. Andrews (H. C.). Coloured Engravings of Heaths. London, 1802-30. 4 vols. 4to.

A. F. B. .. Loudon (J. C.). Arboretum et Fruticetum britannicum. London, 1838. 8 vols. 8vo.

A. F. P .. .. Allioni (C.) Flora pedemontana. Aug. Taur., 1785. 3 vols. Fol.

A. G. .. .. Aublet (J. B. C. F.). Histoire des Plantes de la Guiane française. Londres, 1775. 4 vols. 4to.

A. H. .. .. Andrews (H. C.). The Heathery. London, 1804-12. 4 vols. 4to.

B. .. .. .. Maund (B.). The Botanist. London, 1839. 8 vols. 4to.

B. F. F. .. Brandis (D.). Forest Flora of . . . India. London, 1876, 8vo. Atlas 4to.

B. F. S... .. Beddome (R. H.). Flora sylvatica. Madras, 1869-73. 2 vols. 4to.

B. H. .. .. La Belgique Horticole. Ghent, 1850-85. 8vo.

B. M. .. .. Botanical Magazine. London, 1787, &c. 8vo.*

B. M. Pl. .. Bentley (R.) and Trimen (H.). Medicinal Plants. London, 1875-80. 8vo.

B. O. .. .. Bateman (James). A Monograph of Odontoglossum. London, 1874. Fol.

B. R. .. .. Botanical Register. London, 1815-47. 33 vols. 8vo.

B. Z. .. .. Botanische Zeitung. Berlin, vols. i.-xiii. (1843-55). 8vo. Leipzig, vol. xiv. (1856), &c.*

C. H. P. .. Cathcart's Illustrations of Himalayan Plants. London, 1855. Fol.

Enc. T. & S. Loudon (J. C.). Encyclopædia of Trees and Shrubs. London, 1842. 8vo.

E. T. S. M. .. *See* T. S. M.

F. A. O. .. Fitzgerald (R. D.). Australian Orchids. Sydney, 1876. Fol.*

F. D. .. .. Flora Danica—usually quoted as the title of the work, Icones Plantarum . . . Daniæ et Norvegiæ. Havniæ, 1761-1883. Fol.

F. d. S. .. .. La Flore des Serres et des Jardins de l'Europe. Gand., 1845-83. 23 vols. 8vo.

Fl. Ment. .. Moggridge (J. T.). Contributions to the Flora of Mentone. London, 1864-8.

Flora .. .. Flora oder allgemeine botanische Zeitung. 1818-42. 25 vols. 8vo. New Series, 1843, &c.*

F. M. .. .. Floral Magazine. London, 1861-71, 8vo. Series II. 1872-81, 4to.

F. & P. .. .. Florist and Pomologist. London, 1868-84. 8vo.

G. C. .. .. The Gardeners' Chronicle and Agricultural Gazette. London, 1841-65. 4to.

G. C. n. s. .. The Gardeners' Chronicle. New Series, 1866-86. 4to. Series III. 1887, &c. 4to.*

G. G. .. .. Gray (A.). Genera Floræ Americæ. Boston, 1848-9. 2 vols. 8vo.

G. M. .. .. The Gardeners' Magazine. Conducted by Shirley Hibberd. London.*

G. M. B. .. The Gardeners' Magazine of Botany. London, 1850-1. 3 vols. 8vo.

Gn... .. .. The Garden. London, 1871, &c. 4to.*

G. W. F. A... Goodale (G. L.). Wild Flowers of America. Boston, 1877. 4to.

G. & F... .. Garden and Forest. New York, 1888, &c. 4to.*

H. B. F. .. Hooker (W. J.). The British Ferns. London, 1861. 8vo.

H. E. F. .. Hooker (W. J.). Exotic Flora. Edinburgh, 1823-7. 3 vols. 8vo.

H. F. B. A. .. Hooker (W. J.). Flora boreali-americana. London, 1833-40. 2 vols. 4to.

H. F. T. .. Hooker (J. D.). Flora Tasmaniæ. London, 1860. 2 vols. 4to. This is part iii. of "The Botany of the Antarctic Voyage of H.M. Discovery Ships *Erebus* and *Terror*, in the years 1839-43."

H. G. F. .. Hooker (W. J.). Garden Ferns. London, 1862. 8vo.

H. S. F. .. Hooker (W. J.). Species Filicum. London, 1846-64. 5 vols. 8vo.

I. H. .. .. L'Illustration Horticole. Series I. to IV. Gand., 1850-86. 33 vols. 8vo. Series V. 1887, &c. 4to.*

I. H. Pl. .. *See* C. H. P.

J. B. .. .. Journal of Botany. London, 1863, &c. 8vo.*

J. F. A .. .. Jacquin (N. J.). Floræ austriacæ . . . Icones. Viennæ, 1773-8. 5 vols. Fol.

J. H. .. .. Journal of Horticulture and Cottage Gardener. Conducted by Dr. Robert Hogg. London, 1849, &c. 4to.*

J. H. S. .. .. Journal of the Horticultural Society. London, 1846, &c. 8vo.*

K. E. E. .. Kotschy (Theodor). Die Eichen Europa's und des Orient's. Wien, Olmüz, 1858-62. Fol.

L. .. .. .. Linden (L.) and Rodigas (É.). Lindenia Iconographie des Orchidées. Gand., 1885, &c. Fol.*

L. B. C. .. .. Loddiges (C.). Botanical Cabinet. London, 1812-33. 20 vols. 4to.

L. C. B. .. .. Lindley (J.). Collectanea botanica. London, 1821. Fol.

L. E. M. .. La Marck (J. B. P. A. de M. de). Encyclopédie methodique . . . Botanique. Paris, 1783-1817. 13 vols. 4to.

L. J. F. .. .. Lemaire (C.). Le Jardin fleuriste. Gand., 1851-4. 4 vols. 8vo.

L. R. .. .. Lindley (J.). Rosarum Monographia. London, 1820. 8vo.

L. S. O. .. .. Lindley (J.). Sertum Orchidaceum. London, 1838. Fol.

L. & P. F. G. Lindley (J.) and Paxton (J.). Flower Garden. London, 1851-3. 3 vols. 4to.

M. A. S. .. Salm-Dyck. Monographia Generum Aloes et Mesembryanthemi. Bonnæ, 1836-63. 4to.

M. C. .. .. Maw (George). A Monograph of the Genus Crocus London, 1886. 4to.

M. O. .. .. Veitch (James) and Sons. Manual of Orchidaceous Plants. London, 1887, &c. 8vo.*

N. .. .. .. Burbidge (F. W.). The Narcissus: Its History and Culture. With a Scientific Review of the Genus by J. G. Baker, F.L.S. London, 1875. 8vo.

N. S. .. .. Nuttall (T.). North American Sylva. Philadelphia, 1865. 3 vols. 8vo.

P. F. G. .. *See* L. & P. F. G.

P. M. B. .. Paxton (J.). Magazine of Botany. London, 1834-49. 16 vols. 8vo.

R. .. .. .. Sander (Fredk.). Reichenbachia. London, 1886, &c Fol.*

Ref. B. .. .. Saunders (W. W.). Refugium botanicum. London, 1869-72. 8vo.

R. G. .. .. Regel (E.). Gartenflora. Erlangen, 1852, &c. 8vo.*

R. H. .. .. Revue Horticole. Paris, 1852, &c.*

R. S. H. .. Hooker (J. D.). The Rhododendrons of Sikkim-Himalaya. London, 1849-51. Fol.

R. X. O. .. Reichenbach, *fil.* (H. G.). Xenia Orchidacea. Leipzig, 1858. 4to.*

S. B. F. G. .. Sweet (R.). British Flower Garden. London, 1823-9. 3 vols. 8vo. Series II. London, 1831-8. 4 vols. 8vo.

S. C. .. .. Sweet (R.). Cistineæ. London, 1825-30. 8vo.

S. E. B... .. Smith (J. E.). Exotic Botany. London, 1804-5. 2 vols. 8vo.

S. F. A... .. Sweet (R.). Flora australasica. London, 1827-8. 8vo.

S. F. d. J. .. Siebold (P. F. de) and Vriese (W. H. de). Flore des Jardins du Royaume des Pays-Bas. Leide, 1858-62. 5 vols. 8vo.

S. F. G... .. Sibthorp (John). Flora græca. London, 1806-40. 10 vols. Fol.

S. H. Ivy. .. Hibberd (Shirley). The Ivy: a Monograph. London, 1872. 8vo.

Sw. Ger. .. Sweet (Robert). Geraniaceæ, the Natural Order of Gerania. London, 1828-30. 8vo.

Sy. En. B. .. Syme (J. T. B.), *now* Boswell. English Botany. . . Ed. 3. London, 1863-85. 12 vols. 8vo.

S. Z. F. J. .. Siebold (P. F. von) and Zuccarini (J. G.). Flora Japonica. Lugd. Bat., 1835-44. Fol.

T. H. S... .. Transactions of the Horticultural Society. London, 1805-29. 7 vols. 4to.

T. L. S. .. .. Transactions of the Linnæan Society. London, 1791, &c. 4to.*

T. S. M. .. Emerson (G. B.). Trees and Shrubs . . . of Massachusetts. Boston. Ed. 2, 1875. 2 vols. 8vo.

W. D. B. .. Watson (P. W.). Dendrologia britannica. London, 1825. 2 vols. 8vo

W. F. A. .. *See* G. W. F. A.

W. G. Z. .. Wittmack (Dr. L.). Garten Zeitung. Berlin, 1882, &c. 8vo.*

W. O. A. .. Warner (R.) and Williams (B. S.). The Orchid Album. London, 1882, &c. 4to.*

W. S. O. .. Warner (R.). Select Orchidaceous Plants. London. Series I., 1862-65. Fol. Series II., 1865-75. Fol.

W. & F. .. Woods and Forests. London, 1883-4. 1 vol. 4to.

* Is still in course of publication.

THE

DICTIONARY OF GARDENING,

An Encyclopædia of Horticulture.

The following are the Abbreviations used:—*fl.* flowers; *fr.* fruit; *l.* leaves; *h.* height; *deg.* degrees; *rhiz.* rhizomes; *cau.* caudex; *sti.* stipes; SYN. synonym; ORD. order.
The Asterisks (*) indicate plants that are especially good or distinct.

A. In compound words from the Greek the initial *a* has usually a privative meaning; as *aphyllus*, without leaves; *acaulis*, without a stem, &c.

AARON'S BEARD. *See* **Hypericum calycinum, Saxifraga sarmentosa, and Verbascum Thapsus.**

AARON'S ROD. *See* **Verbascum Thapsus.**

ABELE TREE. White Poplar. *See* **Populus alba.**

ABELIA (named after Dr. Clarke Abel, Physician to Lord Amherst's Embassy to China, in 1817, and author of a "Narrative of a Journey to China" (1818); died 1826). ORD. *Caprifoliaceæ*. Very ornamental shrubs. Corolla tubular, funnel-shaped, five-lobed. Leaves petiolate, dentately crenated. Well suited for the cold greenhouse, either as trellis or pot plants; free-flowering when well grown, and of easy culture. May be treated in sheltered and warm climates as hardy; and can be grown out of doors during summer in less favoured spots. They thrive in a compost of peat and loam in equal parts, to which a small quantity of silver sand may be added. Increased by cuttings in summer, and by layers in spring, under a frame. Only two species, *floribunda* and *rupestris*, are much grown in England.

A. floribunda (many-flowered).* *fl.* rosy-purple, about 2in. long, in axillary clusters. March. *l.* opposite, oblong. *h.* 3ft. Mexico, 1842. The best and freest flowering evergreen species.

A. rupestris (rock).* *fl.* sweet-scented, small, pink, in pairs at the ends of the branches; sepals of leafy texture, with a reddish tinge. September. *l.* small, oblong. *h.* 5ft. China, 1844. A deciduous, branching, hairy shrub.

A. serrata (serrate-leaved). *fl.* pretty pale red, sweet-scented, very large, in one-flowered terminal peduncles; sepals leafy. March. *h.* 3ft. China, 1844. A fine evergreen species.

A. triflora (three-flowered).* *fl.* pale yellow, tinged with pink, small, arranged in threes at the ends of the branches; sepals long and linear, clothed with long hairs. September. *l.* small, lanceolate. *h.* 5ft. Hindostan, 1847. A small evergreen branching shrub.

ABERRANT. Deviating from the natural or direct way; applied, in natural history, to species or genera that deviate from the usual characters of their allies.

ABIES (from *abeo*, to rise; alluding to the aspiring habit of growth of the tree; or, according to some, from *apios*, a Pear-tree, in allusion to the form of the fruit). Spruce Fir. The synonymy of this genus is much confused, plants belonging to several genera being frequently referred to *Abies* in nurserymen's catalogues and gardening periodicals. ORD. *Coniferæ*. A genus of about twenty-five species, widely distributed over the mountainous regions of the Northern hemisphere. Cones cylindrical, or but slightly tapering, erect; catkins generally solitary; the carpels not thickened at the tip; and the leaves solitary, partially scattered in insertion, and more or less two-ranked in direction. Scales deciduous, falling off as soon as the seed is ripe, leaving the axis on the tree. All the species bear seeds at a comparatively early age; most are hardy. For culture, *see* **Pinus.**

A. amabilis (lovely).* *shoots* rather rigid, furrowed with elongated cushions, covered with numerous small dark hairs. *l.* scattered, crowded, 1½in. to 2in. long; linear obtuse, dark green above, silvery beneath. The cones are described as cylindrical, and about 6in. long. *h.* 180ft. California, 1831. A magnificent conifer, very massive in appearance.

A. baborensis.* *l.* linear, dark green, silvery on the under surface, very numerous, those of the larger branches shortly pointed, and those of the branchlets more obtuse and pointless, ½in. to 1in. long. *cones* erect, cylindrical, usually in clusters of four or five, 5in. to 8in. long, and about 2in. in diameter; scales reniform, greyish-brown, inclosing a thin, dry, and shrivelled bract. *h.* 40ft. to 60ft. Algiers, 1864. This is a very beautiful medium-sized tree. SYN. *A. Numidica*.

A. balsamea.* Balm of Gilead or Balsam Fir. *l.* silvery beneath, apex emarginate or entire, somewhat recurved and spreading, ¾in. long. *cones* cylindrical, violet-coloured, pointing upwards, 4in. to 5in. long, and ½in. broad; scales ⅔in. broad, and the same in length. *h.* 40ft. to 60ft. United States and Canada, &c., 1696. A medium-sized slender tree.

A. bifida (bifid). Identical with *A. firma*.

A. brachyphylla (short-leaved).* *l.* linear, spirally inserted round the branchlets, but pointing laterally in two directions, ¾in. to

Abies—*continued.*

1½in. in length; lower ones longest, obtusely pointed or emarginate, bright green above, with two silvery lines beneath. *cones* 3in. to 4in. long, purple. *h.* 120ft. Japan, 1870. A recently introduced magnificent fir, with an erect stem, regularly whorled horizontal branches.

A. bracteata (bracted).* *l.* rigid, linear, flat, distichous, 2in. to 3in. long, bright glossy green above, and glaucous beneath. *cones* about 4in. long, with the bracts developed into long rigid leaf-like linear spines, 2in. long, and slightly curved inwards. *h.* 25ft. Southern California, 1853. A very handsome tall slender tree, but, owing to its very early growth of new shoots, it is much injured by the spring frosts.

A. Brunoniana (Brown's). Synonymous with *Tsuga Brunoniana.*

A. canadensis (Canadian). A synonym of *Tsuga canadensis.*

A. cephalonica (Cephalonian).* *l.* subulate, flat, dark green above, and silvery beneath, acute. *cones* erect, cylindrical, green when young, afterwards reddish, and brown when ripe, 5in. to 6in. in length, and about 1½in. in diameter; scales broad, thin, and rounded, shorter than the bracts. *h.* 50ft. to 60ft. Mountains of Greece, 1824. A very desirable tree for growing in exposed situations.

A. cilicica (Cilician). *l.* linear, slightly curved or straight, 1in. to 1½in. long, dark green above, and glaucous beneath, crowded, in two ranks. *cones* cylindrical, 6in. to 8in. long; scales broad, thin, entire, coriaceous. *h.* 40ft. to 60ft. Mount Taurus, in Asia Minor. This species seldom produces a good specimen tree in England, and cannot, therefore, be recommended for general cultivation.

A. concolor (one-coloured).* *l.* linear, flat, obtuse, glaucous green, distichously arranged in double rows, those in the lower rows 2in. to 3in. long, upper ones shorter, channelled above. *cones* cylindrical, obtuse both at base and top, 3in. to 5in. long, 2in. to 2½in. in diameter; scales numerous, imbricated, larger than the bracts. *h.* 80ft. to 150ft. California, &c., 1851. A very beautiful species, with yellow bark on the young branches. SYNS. *A. lasiocarpa* and *A. Parsonii.*

A. Douglasii (Douglas'). A synonym of *Pseudotsuga Douglasii.*

A. dumosa (short-leaved). Synonymous with *Tsuga Brunoniana.*

A. excelsa (tall). A synonym of *Picea excelsa.*

A. firma (solid).* *l.* rigid, coriaceous, spirally arranged around the branchlets, but point laterally in two directions, 1in. to 1½in. long, very variable in young and old trees. *cones* cylindrical, obtuse at both ends, 3in. to 6in. long; scales imbricated, bearing protruding keeled bracts. *h.* 100ft. Japan, 1861. An erect tree, of great beauty.

A. Fortunei (Fortune's). It is said that in its native country, its aspect is peculiar rather than handsome, and that but one living representative is believed to be in existence in this country—at Veitch's Nursery. SYN. *Keteleeria Fortunei.*

A. Fraseri (Fraser's). Double Balsam Spruce Fir. *l.* linear, emarginate, silvery beneath. *cones* oblong, squarrose, somewhat leafy, obcordate, mucronate, half exserted, reflexed. *h.* 30ft. to 40ft. North Carolina, 1811. This species closely resembles *A. balsamea*, from which it differs in having shorter and more erect leaves, and smaller cones.

A. grandis (splendid).* *l.* in double rows, on each side of the branchlets, flat, obtuse, emarginate, pectinate, silvery beneath, from ⅜in. to 1in. long. *cones* lateral, solitary, cylindrical, obtuse at base and apex, 4in. to. 5in. long, 2in. wide; bracts ovate, acuminate, irregularly dentate, very short. *h.* 100ft. California, 1831. A handsome tree of symmetrical habit, and rapid growth.

A. lasiocarpa (woolly-coned). Synonymous with *A. concolor.*

A. magnifica (magnificent).* *l.* densely crowded, two-rowed, 1in. to nearly 2in. long, olive green, very glaucous on the upper surface when young, becoming duller with age, and marked with two silvery lines beneath. *cones* 6in. to 7in. long, 2½in. to 3in. in diameter; scales, outer edge incurved. *h.* 200ft. North California, 1851. A very tall and stately species, with, at successive intervals, whorls of horizontal branches.

A. Mariesii (Maries'). *l.* erect, evenly disposed around the stem, linear-oblong, obtuse; apex notched, ½in. to not quite 1in. long; bracts ovate, oblong, retuse. *cones* erect, cylindrical, 3½in. to 5½in. long, 1½in. to 2in. wide, narrowed at the base and apex, blackish purple; scales entire, nearly 1in. wide, not quite so long as wide. Japan, 1879. A tall, pyramidal tree.

A. Mertensiana (Mertens'). Synonymous with *Tsuga Mertensiana.*

A. miniata (vermilion). Synonymous with *Picea eremita.*

A. Morinda (Morinda). Synonymous with *Picea Morinda.*

A. nobilis (noble).* *l.* linear, mostly on one side of the branches, falcate, short, acute, silvery beneath, 1¾in. long. *cones* cylindrical, erect, sessile, 6½in. long, 2¾in. broad, brownish; scales triangular, without the bractea, 1¼in. long, and the same in breadth; bractea spathulate, imbricated backwards, ⅝in. long. *h.* 200ft. to 300ft. California, 1831. A majestic tree.

A. Nordmanniana (Nordmann's).* *l.* linear, rigid, flat, and minutely bifid at the apex, on young trees spreading in two rows, with a half-twist at the base, 1in. long. *cones* erect, slightly ovoid,

Abies—*continued.*

pedunculate, 4in. to 6in. long, and 2½in. to 2¾in. wide; bracts large, coriaceous, three-lobed, fringed, greatly exceeding the scales. *h.* 80ft. to 100ft. Crimea, &c., 1848. A magnificent and stately tree, of regular growth.

A. Numidica (Numidian). Synonymous with *A. baborensis.*

A. obovata (reversed-egg-coned). A synonym of *Picea obovata.*

A. orientalis (eastern). Synonymous with *Picea orientalis.*

A. Parsonii (Parson's). Synonymous with *A. concolor.*

A. pectinata (comb-like).* *l.* linear, solitary, flat, obtuse, stiff, turned-up at the points, two-ranked, ½in. to 1in. long, shining green above, with two lines of silvery white on each side of the midrib beneath. *cones* axillary, cylindrical, erect, 6in. to 8in. long, 1½in. to 2in. broad, when ripe, brown; scales with a long dorsal bractea, ½in. to 1¼in. long, and 1½in. broad. *h.* 80ft. to 100ft. A very noble silver fir, of slow growth when young only. Central Europe, 1603. There are several unimportant varieties of this splendid species.

A. Pindrow (Pindrow). In its native home, the Himalayas, this is a very beautiful tree, attaining the height of 150ft., but it has generally failed in England, in consequence of our late spring frosts destroying the young growth. It comes very near *A. Webbiana*, but is readily distinguished by its longer and more acutely bidented leaves, and smaller cones.

A. Pinsapo (Pinsapo).* The Spanish Silver Fir. *l.* linear, disposed around the branches, nearly terete, and entire at the apex, not quite ½in. long, bright green, with faint silvery lines on the inner side. *cones* sessile, oval, or oblong, 4in. to 5½in. long, about 2in. wide; bracts short, concealed by the broad rounded scales. *h.* 60ft. to 80ft. South Spain, 1839. A very magnificent species, very regular and symmetrical in habit. The one or two varieties offered for sale are not desirable.

A. polita (neat).* *l.* arranged spirally, short, erect, rigid, falcate, acute at the apex, tetragonal, but compressed. *cones* ellipsoid, 3in. to 4in. long; scales light brown, coriaceous, minutely notched at the edge. Island of Nippon, 1861. This is a beautiful species, admirably adapted as a specimen tree for lawns.

A. religiosa (sacred). *l.* linear, acute, quite entire, 1½in. long. *cones* roundish-oval, 2¾in. long, and 2½in. broad; scales trapezoided-cordate; bracts the length of the scapes, spathulate-oblong. *h.* 100ft. to 150ft. Mexico, 1839. A very handsome species, but not hardy in this country.

A. sachalinensis (Sachalin). *l.* in many rows, 1in. or very slightly more long, ⅛in. broad, twisted to one side, rigid, linear, obtuse. *cones* sessile, erect, cylindrical, bluntly rounded at the apex, 3in. long, 1in. wide; scales transversely oblong, reniform; margin inflexed, denticulate; bracts ½in. wide, ¼in. long, obovate, serrulate, terminating in a reflexed angular point, exceeding the scale. Japan, 1879. A tall pyramidal robust species.

A. Schrenkiana (Schrenk's). Synonymous with *Picea Schrenkiana.*

A. sibirica (Siberian). Like the last, this species is not recommended; its growth is very slow, even under the most favourable circumstances. Siberia.

A. Smithiana (Smith's). A synonym of *Picea Morinda.*

A. subalpina (sub-alpine).* On the high mountains of Colorado, &c., a tree 60ft. to 100ft. in height. Has not been long enough in English gardens for any decided opinion to be formed as to its merits as an ornamental tree.

A. Tsuga (Tsugan). A synonym of *Tsuga Sieboldi.*

A. Veitchii (Veitch's).* *l.* crowded, lateral ones spreading in a distichous manner, those on the upper side much shorter and pointing forwards, ½in. to 1in. long, linear, flat, glaucous above, silvery beneath; emarginate on the sterile branches, entire on the fertile ones. *cones* erect, sub-cylindrical, purplish-brown, 2in. to 2½in. long, ⅜in. to nearly 1in. wide; scales horizontal, reniform, densely packed, each enclosing a short, wedge-shaped bract as long as the scale. *h.* 120ft. to 140ft. Japan, 1860, and again in 1879. Described as a beautiful and interesting tree, as well as perfectly hardy; it should be planted on elevated spots open to the south or south-east.

A. Webbiana (Webb's).* *l.* two-rowed, linear, flat, obtusely emarginate, silvery beneath, 1½in. to 2½in. long. *cones* cylindrical, 6½in. to 7in. long, 2in. or more broad, deep purple; scales kidney-shaped, roundish, closely compressed, imbricated, about 1in. long, and 1½in. broad; bracts oblong, apiculate. *h.* 70ft. to 90ft. Himalayan Mountains, 1822. A large handsome pyramidal tree, with numerous branches spreading horizontally, much divided, and densely clothed.

A. Williamsoni (Williamson's). A synonym of *Tsuga Pattoniana.*

ABOBRA (its Brazilian name). ORD. *Cucurbitaceæ.* A genus of stove or greenhouse plants, having solitary axillary dicœcious flowers, and finely divided leaves. The only species in cultivation is a very pretty half-hardy climbing perennial, having a fleshy root about 1ft. or more beneath the surface of the soil. It thrives well in warm sunny spots, and in a light soil; seeds may be sown in pots or pans of light soil early in April; the young plants can be planted out about the middle of June. The fleshy

Abobra—*continued.*

tuberous roots may be stored during winter in a greenhouse or frame. *See* also **Gourds.**

A. viridiflora (green-flowered). *fl.* pale green, fragrant; females succeeded by small oval scarlet fruits, which are about as large as a filbert. *l.* dark green, glossy, much divided into narrow segments. South America. A rapid growing plant, admirably adapted for training over arbours or trellis-work. It is a very pretty form of ornamental gourd.

ABORTION. An imperfect formation, or the non-formation of an organ; any fruit or produce that does not come to maturity, or anything which fails in its progress before it is matured, frequently from a defect in the male or female flowers.

ABRAXAS GROSSULARIATA. *See* **Gooseberry or Magpie Moth.**

ABRICOCK. A former mode of writing Apricot.

ABROMA (from *a*, not, and *broma*, food; from its unwholesomeness). ORD. *Sterculiaceæ*. Handsome, free-flowering evergreen trees, with hairy lobed leaves, and extra axillary or terminal few-flowered peduncles. Of easy culture, in a stove temperature, in loam and peat soil. Propagated by seeds or cuttings, the former sown in March, the latter made in April from half-ripened wood, and placed under a bell glass.

A. augusta (smooth-stalked).* *fl.* dingy purple, drooping. August. *l.* lower, cordate, three to five lobed; upper, ovate-lanceolate, undivided. *h.* 10ft. East India, 1770.

A. fastuosa (prickly-stalked). *fl.* dark purple. June. *l.* lower, cordate, acutely five lobed; upper, ovate, entire. *h.* 10ft. New Holland, 1800.

ABRONIA (from *abros*, delicate; referring to its involucrum). Sand Verbena. ORD. *Nyctaginaceæ*. A small genus of seven species, mostly natives of California, four of which only are known in general cultivation. They are

FIG. 1. ABRONIA UMBELLATA, showing Habit and Inflorescence.

of a dwarf trailing habit, producing showy blossoms in dense verbena-like clusters. Corolla funnel-shaped; limb spreading. They succeed best in light sandy soil, in a position fully exposed; if well drained, the rockery is perhaps the best place. Increased by seeds, the outer skin of which should be peeled off before sowing; sow during autumn in pots of sandy soil, and keep in a frame until the following spring, when they may be placed in their flowering quarters; or by young cuttings, set in spring, and also in sandy soil.

A. arenaria (sand-loving).* *fl.* lemon-yellow, about ½in. long, in dense clusters, with a honey-like fragrance. July. *l.* broadly ovate, or reniform, on short, thick petioles. *h.* 9in. to 18in. 1865. Half-hardy perennial. SYN. *A. latifolia.*

Abronia—*continued.*

A. fragrans (fragrant).* *fl.* pure white, in terminal and axillary clusters, very delicately perfumed, expanding in the evening. May. 1865. A perennial, more or less erect in growth, forming large branching tufts from 1ft. to 2ft. high. Imported seeds only of this species will grow.

A. latifolia (broad-leaved). A synonym of *A. arenaria.*

A. pulchella (pretty). *fl.* pink. July. *h.* 6in. 1848.

A. rosea (rose-coloured). *fl.* rose-coloured. June. *h.* 6in. 1847. An unimportant species.

A. umbellata (umbel-flowered).* *fl.* rosy pink, in dense terminal clusters, slightly scented. April. *l.* oval or oblong. *h.* 6in. to 24in. 1823. An elegant prostrate half-hardy annual; but under greenhouse culture it is a perennial. SYN. *Tricratus admirabilis.* See Fig 1.

ABRUPT. Suddenly terminating, as abruptly pinnate; when pinnate leaves are without a terminal or odd leaflet.

ABRUS (from *abros*, soft, in reference to the extreme softness of the leaves). ORD. *Leguminosæ*. A very ornamental and delicate much branched deciduous stove climber, whose roots have the virtues of the common liquorice. Leaves abruptly pinnate, bearing many pairs of leaflets. Requires a strong heat to keep it in a growing, healthy condition, and to flower it well; and thrives best in sandy loam. Increased by cuttings under a hand glass, in sand, or seeds raised in heat.

A. precatorius (prayer). *fl.* pale purple, butterfly-shaped, disposed in axillary clusters. Seeds bright scarlet, with a black spot at the base, used by the Buddhists for making rosaries, whence the specific name. March to May. *l.* leaflets ligulate, oblong. *h.* 12ft. East Indies, 1680. Varieties are now and then met with having rose coloured or white flowers.

ABSORPTION. The action by which liquids and gases become incorporated with various bodies, through molecular or other invisible means, to which function all parts of a growing plant contribute, the roots more especially.

ABUTA (native name). ORD. *Menispermaceæ*. A strong growing ornamental stove evergreen climber. Used medicinally in Cayenne. Flowers dicœcious, fascicled, males racemosely panicled; females loose and simply racemose. It grows freely in a mixture of loam and peat. Cuttings will root readily if planted in a pot of sand, with a hand glass placed over them, in heat. About half-a-dozen species are known.

A. rufescens (rusty-coloured). *fl.* grey-velvety on the outside, dark purple on the inside. March. *l.* ovate; under surface brownish. *h.* 10ft. Cayenne, 1820.

ABUTILON (Arabic name for a plant analogous to the Marsh Mallow). ORD. *Malvaceæ*. Very showy, decorative, and free-growing shrubs, both for the greenhouse and outside culture. Calyx naked, five-cleft, usually angular; style multifid at apex. The many beautiful hybrids (of which Fig. 2 represents a group) now in cultivation, far supersede the true species. Cultivation: Few plants are more easily grown and worthy of liberal treatment than these. The best soil for them is equal parts turfy loam, peat, and leaf mould, with some gritty sand. They may either be grown in pots, or planted out; but in all cases thorough drainage is indispensable, as they require an abundance of water, and stagnancy must be guarded against. At the end of May they may be planted outside, when they will flower profusely through the summer. In a free growing and flowering state they enjoy weak manure water. From the latter part of autumn till early spring they may be kept almost dry without injury, though in a warm conservatory some of the later struck plants will go on flowering throughout the greater part of the winter; or plants may be specially prepared for winter flowering. They are admirably adapted for forming standards of various heights, from 2ft. to 6ft. Some of the taller sorts are very useful for training under roof rafters. As pillar plants, too, very loosely trained, so as to allow the upper and side branches to droop to a considerable distance from the pillar, they are very effective. Propagation: They strike readily from cuttings made

Abutilon—*continued.*

of the young wood, at almost any season; the best time, however, is early spring and September. Inserted in pots, in a compost of equal parts peat, leaf mould, loam, and sand, and placed in a temperature of from 65deg. to 70deg., they will then quickly root, and form good plants. Seeds may be sown in pans filled with soil as recommended for cuttings, and placed in a similar temperature. Those followed by a dagger (†) are the best for training to pillars, roofs, &c.

A. Bedfordianum (Bedford's). *fl.* yellow and red. November. *l.* deeply-lobed. *h.* 15ft. Brazil, 1838.

A. Darwini (Darwin's).†* *fl.* bright orange, with darker veinings, fine cupped form. April. *l.* large, broad. *h.* 4ft. Brazil, 1871. A handsome species, of good habit, equally suitable as a stove or greenhouse plant during winter, and for outdoor culture during summer months. There are a great number of garden hybrids from this.

A. globiflorum (globe-flowered). *fl.* solitary, large, globose, cream-coloured. November. *l.* on long stalks, cordate, serrate. *h.* 4ft. to 5ft. Mauritius, 1825.

A. igneum (bright). Synonymous with *A. insigne.*

A. insigne (handsome-flowered).* *fl.* large, purplish crimson, with dark venation, in axillary pendulous racemes; petals short, broad, much reflexed. Winter. *l.* large, cordate, thick, rugose Stem deep green, with short brown hairs. *h.* 6ft. New Grenada, 1851. SYN. *A. igneum.* See Fig. 3.

A. megapotamicum (big river).†* *fl.* small, bell-shaped, singularly beautiful, the sepals being dark red, petals pale yellow, and stamens dark brown. Autumn and winter. *l.* small, pointed. *h.* 3ft. Rio Grande, 1864. A free-flowering species, with a graceful drooping habit; the shoots should be well pressed in during spring. SYN. *A. vexillarium.*

A. pæoniflorum (pæony-flowered). *fl.* pink, smaller than those of *A. insigne*, but very distinct. January. *l.* large, ovate. *h.* 6ft. Brazil, 1845.

A. pulchellum (pretty).†* *fl.* white, on few-flowered axillary racemes. July. *l.* cordate, unequally crenated, downy beneath. *h.* 8ft. Habit very branching. New Holland, 1824.

A. striatum (striped).* *fl.* orange yellow, with a thick veining of blood-red, on long curving stalks. *l.* large, lobed, on long slender petioles. Brazil, 1837. A free grower, and makes an excellent greenhouse plant. In sheltered positions, in the south-west of England, this species proves to be almost hardy. It requires to be freely pinched. A very continuous bloomer.

A. Thompsoni (Thompson's). *fl.* striated yellow, large. Summer. *l.* small, vine-like, richly mottled with yellow and dark green. *h.* 3ft. or 4ft. Habit very neat and erect.

A. venosum (veined).†* *fl.* orange, with red veins, very large, bell shaped, 3in. long; pedicels nearly 12in. long. July. *l.* large, deeply palmate. *h.* 10ft. This splendid species is distinguished by its unusually large flowers.

A. vexillarium (standard). Synonymous with *A. megapotamicum.*

A. vitifolium (vine-leaved).* *fl.* porcelain blue, large, cupped. May. *l.* cordate, five to seven lobed, assuming, towards the autumn, a fine golden hue. *h.* 30ft. Chili, 1837. This fine shrub, or tree, is hardy in Ireland and the south of England, but should have a protection from frost. It is not a fast grower.

The following are some of the best varieties, which, although they do not include all the newest sorts, yet afford a good selection of first-rate kinds, which will give general satisfaction. They are arranged according to their respective colours. Those marked with a dagger (†) are best for roofs and pillars.

Orange-flowered. AUREUM GLOBOSUM,* flowers deep orange, heavily red shaded, of medium size, with good form and substance; DARWINI MAJUS,* bright orange, deeply veined, extremely

Abutilon—*continued.*

free, and of good form and size; FLEUR D'OR,† light orange, veined pale red, very free and dwarf; GRANDIFLORUM,* deep orange, red shaded, deeply veined with red, a robust, large-flowered variety; LEO, flowers pale below, deeper above, red-veined, of medium size; PRINCE OF ORANGE,†* a strong grower, and very free.

Ornamental-foliaged. DARWINI TESSELATUM,†* foliage mottled with yellow, invaluable for sub-tropical bedding; SELLOWIANUM MARMORATUM,* very large maple-like foliage, heavily mottled with bright yellow, a most effective variety; THOMPSONI, leaves very freely blotched with yellow; VEXILLARIUM IGNEUM,†* very free, of good habit, prettily blotched. All these ornamental-foliaged varieties are invaluable for bedding purposes.

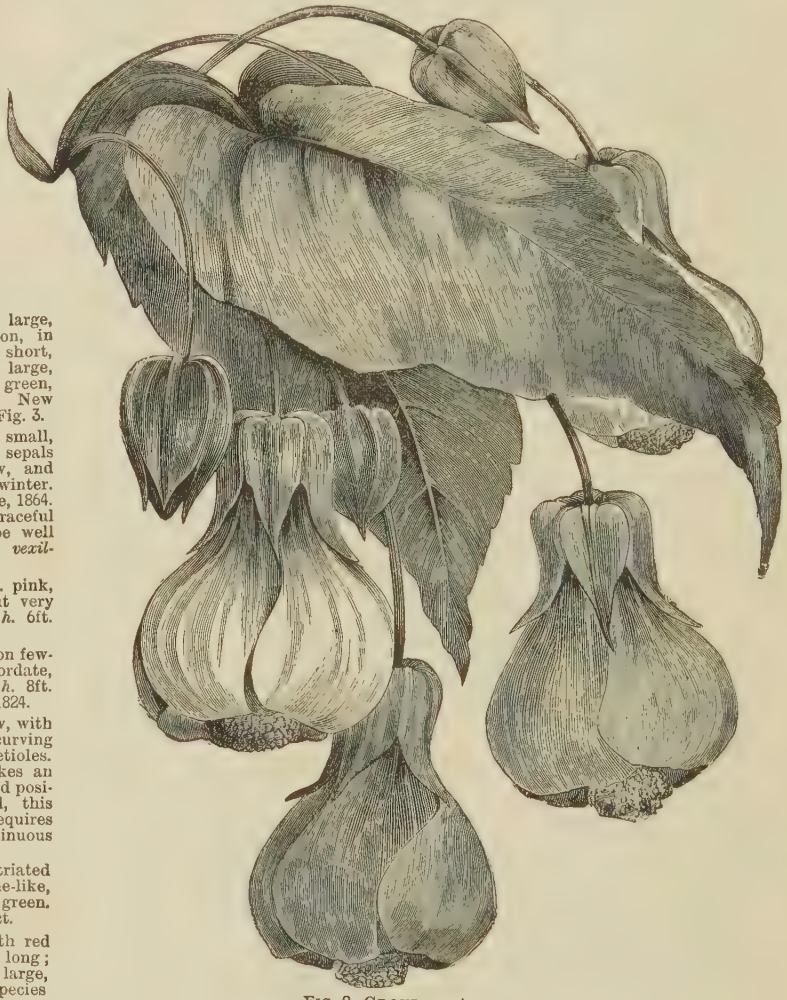


FIG. 2. GROUP OF ABUTILONS.

Purple-coloured. EMPEROR,* flowers large, rich purple magenta shaded, habit vigorous; LOUIS VAN HOUTTE, very free, rosy purple; PURPUREA,* deep purple shaded lake, very attractive; SOUVENIR DE ST. MAURICE, flowers medium size, very profuse; VIOLET QUEEN,* bright violet purple, very distinct and free.

Red and Crimson-flowered. BRILLIANT,* flowers of good form and substance, brilliant red inside, rather paler outside, dwarf and free; CRIMSON BANNER,* rich crimson, dwarf, very floriferous; FIRE KING,* bright red, orange shaded, veined with crimson; LUSTROUS,* brilliant red crimson, large, most profusely produced, habit dwarf; NE PLUS ULTRA,* intense crimson, of excellent form; SCARLET GEM,* flowers medium sized, brilliant scarlet, habit dwarf and free.

Rose-coloured. ADMIRATION, light pink, shaded salmon, of good form and shape; ANNA CROZY,* deep pink, lilac shade, veined white, very showy; CLOCHETTE,* deep rosy pink, with crimson veins, very dwarf and free; DELICATUM, pale salmon rose, with deeper veins, flowers very large; KING OF THE ROSES,* rich deep

Abutilon—*continued.*

rose, of good size and substance, habit dwarf and very free; LADY OF THE LAKE,* flowers medium sized, rich pink; LOUIS MARIGNAC, pale pink, veined white, splendid habit, a charming variety; PRINCESS MARIE,†* flowers rich rosy lake, very profuse, of excellent form; ROSÆFLORUM,†* pale salmon rose, veined with crimson.

White-flowered. BOULE DE NIEGE,†* very fine pure white flowers, the best in its class; PURITY,* very free, of good habit, and pure white; SERAPH,* dwarf, and very floriferous.

FIG. 3. FLOWER OF ABUTILON INSIGNE.

Yellow-flowered. CANARY BIRD,†* similar in habit to Boule de Niege, bright primrose, very lovely; COURONNE D'OR,* bright yellow, of the finest form and substance, very bold foliage; GOLDEN GEM, rich canary yellow, extremely free, of dwarf habit; LEMOINEI,† very fine, pale yellow, good size; QUEEN OF THE YELLOWS,* very large, lemon yellow, good substance; YELLOW PRINCE,* rich golden yellow, of medium size, very profuse.

ABYSSINIAN PRIMROSE. A common name for **Primula Boveana** (which *see*).

ACACIA (from *ac*, a point, in Celtic; or from *akazo*, to sharpen; many of the species are furnished with spines). *See* also *Albizzia*. ORD. *Leguminosæ*. Shrubs or trees, very variable in habit and leaves. Flowers yellow, white, rarely red, disposed in globular heads or spikes, decandrous or polyandrous. Spines stipular, scattered, or wanting. This is a very polymorphous genus, and the majority of species described are known in this country only from herbarium specimens. It is very doubtful whether the entire genus is represented in our gardens by more than about fifty species, many of which are only to be found in botanic gardens; but this number is, without doubt, sufficiently characteristic. The number of species is close upon 400, and the genus one of the largest known. In our enumeration, we have strictly confined ourselves to describing such as are unquestionably in cultivation, and to this end we have adopted the only accurate method of deciding which are and which are not grown, viz., by consulting the trade lists of nurserymen, both in this country and on the Continent. Such lists, however, are not always correct, from a scientific point of view, in the matter of nomenclature. The species best deserving of cultivation are all natives of Australia, New South Wales, or other temperate regions, and are among the hardiest and most easily cultivated of all greenhouse plants. They are very floriferous. The greenhouse species are sufficiently hardy to withstand the winter in a temperature very little higher than freezing point. Cultivation: Some have a tendency to make long

Acacia—*continued.*

straight shoots; these should be selected for training upon rafters or pillars, on which they thrive well and form splendid ornaments in spring; whilst the more shrubby kinds will be equally at home in pots in the form of bushes. Roots and tops grow with great rapidity, and an abundance of water is required at all times. Immediately after flowering (usually about May) is the best time to prune Acacias; they may then be placed in the open air, and fully exposed to the sun, until October. They make a far healthier, cleaner growth, and ripen their wood much better outside than under glass; all they require is copious waterings, never allowing them to become dry, and keeping clear of weeds. In the first week in October house the plants, and winter in a temperature of 40deg. to 50deg. They delight in a light rich compost of equal parts turfy loam and leaf mould, freely intermixed with sand, or peat may be used instead of the leaf mould. Propagation: Cuttings of the half-ripened wood, put in with a heel, root readily during the summer. They do not bear heat well, nor do they require it. The soil should be equal parts peat and sand, covered with pure sand, thoroughly consolidated. Insert the cuttings as soon as made; water home, and leave them in the shade till dry. Then place the bell glasses over them, shade and water so as to prevent flagging. Pot off as soon as rooted, and keep in a close pit or house until the plants are thoroughly established. Seeds should be sown as soon as ripe, in sandy peat; about ¼in. deep, or a little more, for large seeds. A temperature of 55deg. to 60deg. suits them well. Pot off when large enough to handle, and place in a cool close pit or house until quite established. The culture and propagation of the stove species are the same as for the greenhouse sorts, but the former require, of course, greater heat. Their flowers, however, are much less frequently produced than their more temperate congeners, consequently they are not so much grown.

A. affinis.* *fl.* yellow. May. *h.* 5ft. New Holland, 1822. Greenhouse species.

A. albicans (whitish).* *fl.* white; heads, two to five, aggregate, rising in racemes from the axils to the leaves. *l.* with eight to nine pairs of pinnæ, each pinna bearing nineteen to twenty-two pairs of oblong linear-leaflets. *h.* 5ft. Swan River.

A. amœna (pleasing). This closely resembles *A. heterophylla*.

A. angustifolia (narrow-leaved). *fl.* yellow, in heads two to four together, pedunculate. April. *l.* with fifteen to twenty pairs of pinnæ, each pinna bearing thirty to forty pairs of linear-acute, ciliated leaflets. *h.* 4ft. New South Wales, 1816. One of the numerous varieties of *A. longifolia*.

A. arabica (Arabian).* Gum Arabic. *fl.* white; heads pedunculate, axillary, usually in threes. *l.* with four to six pairs of pinnæ, each pinna bearing ten to twenty pairs of oblong-linear leaflets. *h.* 20ft. Arabia, East Indies, &c., 1820. Greenhouse species. See Fig. 4.

A. argyrophylla (silver-leaved). A synonym of *A. brachybotrya*.

A. armata (armed, simple leaved).* *fl.* yellow, in solitary globular heads. April. *l.* phyllodia obliquely ovate-oblong, quite entire, one-nerved. *h.* 6ft. to 10ft. Australia, 1803.

A. Benthami (Bentham's). A synonym of *A. cochlearis*.

A. brachybotrya (short-bunched).* *fl.* yellow, in axillary stalked globular heads. April. *l.* phyllodia silvery silky, obliquely obovate, or oblong. *h.* 8ft. Swan River. SYN. *A. argyrophylla*.

A. Catechu (catechu). *fl.* yellow; spikes cylindrical, solitary, twin, or tern, axillary. March. *l.* with ten pairs of pinnæ, each of which bears forty to fifty pairs of linear pubescent leaflets. *h.* 20ft. to 40ft. East Indies, 1790.

A. cavenia (Cavenia).* *fl.* yellow, disposed in globose heads, peduncles, axillary, aggregate. *l.* with usually about five pairs of pinnæ, each of which bears nine to ten pairs of linear-oblong leaflets, clothed with scabrous pubescence. *h.* 20ft. Chili. Greenhouse species.

A. cochlearis (spoon-leaved). *fl.* yellow, in solitary globular heads. April. *l.* phyllodia linear lanceolate, many-nerved at the base, quite entire, mucronate. *h.* 4ft. West Australia, 1818. SYN. *A. Benthami*.

A. cultriformis (knife-formed).* *fl.* yellow, in crowded heads, disposed in either axillary or terminal racemes. April. *l.* phyllodia eight to ten lines long, four lines broad, cultriform, ending in an acute hooked point, which bears to one side. *h.* 4ft. New South Wales, 1820.

A. cuneata (wedge-shaped).* *fl.* yellow. April. Swan River, 1837. Greenhouse species.

Acacia—*continued.*

A. cyanophylla (blue-leaved). *fl.* yellow; racemes axillary; heads globose. March. *l.* phyllodia lanceolate, often 1ft. long, glaucous green, almost blue; branches drooping. *h.* 18ft. Swan River, 1838. Arboreous.

A. dealbata (whitened).* The Silver Wattle. *fl.* yellow, in pedicellate heads, disposed in racemes along the axillary branches. July. *l.* from ten to twenty pairs of pinnæ, each of which bears thirty to thirty-five pairs of linear, much crowded pubescent leaflets. *h.* 10ft. to 20ft. Australia and Tasmania, 1820.

A. diffusa (spreading). *fl.* yellow, in globular heads, which are usually twin. May. *l.* phyllodia linear, one-nerved, ending in an oblique acumen; branches diffusely procumbent, angular. *h.* 2ft. Victoria and Tasmania, 1814.

A. Drummondi (Drummond's).* *fl.* pale lemon; spikes axillary, drooping, cylindrical, simple. April. *l.* with two pairs of pinnæ, each pinna bearing two to three pairs of linear obtuse leaflets. Plant unarmed, silky. *h.* 10ft. Swan River. Very handsome and one of the best grown, forming a somewhat dwarf shrub.

FIG. 4. ACACIA ARABICA (*a*) Flowering Branch, (*b*) Seed-pod.

A. Farnesiana (Farnesian). *fl.* yellow, sweet-scented, disposed in axillary, usually twin, unequally pedunculate heads. July. *l.* with five to eight pairs of pinnæ, each pinna bearing from fifteen to twenty pairs of linear glabrous leaflets. *h.* 6ft to 10ft. St. Domingo, 1656. Greenhouse species.

A. glauca (milky-white).* *fl.* white; spikes globose, stalked, axillary, usually twin. July *l.* with four to six pairs of pinnæ, each pinna bearing about twelve to fifteen pairs of linear, distant, acute leaflets, which are glaucous beneath. *h.* 5ft. to 10ft. South America, 1690.

A. glaucescens (greyish). *fl.* yellow; spikes twin, but solitary on the peduncles, axillary. June. *l.* phyllodia linear-lanceolate, attenuated at both ends, falcate, three-nerved. *h.* 6ft. to 8ft. Queensland, 1822. SYN. *A. homomalla.*

A. grandis (great).* *fl.* yellow; heads globular; peduncles solitary or twin, axillary, one-headed. February to May. *l.* with one pair of pinnæ, each pinna bearing eight to ten pairs of linear-lanceolate leaflets; branches hairy. *h.* 6ft. West Australia, 1850. A variety of *A. pulchella.*

A. heterophylla (variable-leaved).* *fl.* yellow, in heads, disposed in a kind of raceme. May. *l.* phyllodia linear, attenuated at both ends, many-nerved. *h.* 5ft. Isle of Bourbon, 1824. *A. amœna* is very like this.

A. hispidissima (hairiest). A variety of *A. pulchella.*

A. holosericea (all silky). *fl.* yellow, in axillary spikes, usually twin. May. *l* 6in. long, oblong-lanceolate, ending in a soft point at the apex, three-nerved. *h.* 10ft. to 20ft. Australia, 1818. The whole aspect of this tree is silky. SYN. *A. leucophylla.*

A. homomalla (equal-woolled). A synonym of *A. glaucescens.*

A. Hugelii (Baron Hugel's). *fl.* pale yellow. February. West Australia, 1846. Greenhouse species.

Acacia—*continued.*

A. ixiophylla (Ixia-leaved). *fl.* yellow; heads about twenty-flowered; peduncles downy, shortly racemose or solitary. March. *l.* narrow, oblong-lanceolate, sub-falcate, obtuse, obliquely mucronate, much branched. *h.* 2ft. New South Wales, 1844.

A. juniperina (juniper-leaved). *fl.* yellow, in solitary heads. May. *l.* linear-subulate, ending in a pungent point; branches terete, pubescent. *h.* 6ft. Australia and Tasmania, 1790. Greenhouse.

A. Lebbek (Lebbek).* *fl.* yellow, sweet-scented; heads many-flowered, pedunculate, three or four together, from the crowded upper nodes. May. *l.* with two to four pairs of pinnæ, each pinna bearing about six to eight pairs of oval, somewhat dimidiate leaflets, which are obtuse at both ends. *h.* 20ft. East and West Indies, 1823. Stove species.

A. leprosa (leprous). *fl.* yellow, mostly five-parted, numerous in a globular head; peduncles mostly in pairs or clusters, ¼in. long. May. *l.* narrow, linear-lanceolate, acute or obtuse with a small callous point, narrowed at base, 1½in. to 3in. long, those of the barren shoots broader. Branchlets pendulous, more or less glutinous. Australia, 1817. (B. R. 1441.)

A. leucophylla (white-leaved). A synonym of *A. holosericea.*

A. lineata (lined). *fl.* yellow, mostly five-parted, ten to fifteen or rarely more in a small, globular head; peduncles slender, rarely exceeding the leaves. April. *l.* linear, with a small hooked point, about ¼in., rarely ⅜in., long, one-nerved. Branches nearly terete, usually pubescent or villous. *h.* 6ft. Australia, 1824. (B. M. 3346.)

A. l. longissima (longest). Synonymous with *A. longissima.*

A. longifolia (long-leaved).* *fl.* yellow; spikes loose, axillary, cylindrical. March. *l.* phyllodia linear-lanceolate, narrowed at each end, three-nerved, striated. *h.* 10ft. Australia, 1792. A fine erect-growing greenhouse species.

A. longissima (longest-leaved). *fl.* yellow; spikes several, axillary, generally branched. May. *l.* phyllodia very long, filiform, one-nerved, spreading. *h.* 4ft. New South Wales, 1819. Stove species. SYN. *A. linearis longissima.*

A. lunata (half-moon).* *fl.* yellow; heads disposed in racemes, which are longer than the phyllodia. April. *l.* phyllodia obliquely oblong, rather falcate, narrowed at the base, terminating in an oblique callous mucrone. *h.* 2ft. to 4ft. Australia, 1810. Greenhouse species. SYN. *A. oleæfolia.*

A. melanoxylon (black wooded). *fl.* yellow; heads few, disposed in a kind of raceme. April. *l.* phyllodia lanceolate-oblong, rather falcate, obtuse, quite entire, many-nerved. *h.* 6ft. to 10ft. Australia, 1818. Greenhouse species.

A. mollissima (softest-leaved).* *fl.* yellow; heads pedicellate, disposed in racemes along the axillary peduncles. July. *l.* with eight to eighteen pairs of pinnæ, each pinna bearing thirty to forty pairs of linear, much crowded, pubescent leaflets, which are clothed with yellowish velvety down when young; branches and petioles angular. *h.* 10ft. to 20ft. Van Diemens Land, 1810.

A. oleæfolia (olive-leaved). A synonym of *A. lunata.*

A. oxycedrus (sharp-cedrus).* *fl.* yellow; spikes axillary, solitary, elongated. April. *l.* phyllodia scattered, or somewhat verticillate, lanceolate-linear, ending in a pungent point, three-nerved. *h.* 6ft. to 10ft. New South Wales, 1823. Greenhouse species.

A. paradoxa (paradoxical). *fl.* yellow, disposed in solitary heads. March. *l.* phyllodia obliquely oblong-lanceolate, entire, wavy, one-nerved; branches clammy, glabrous. *h.* 6ft. New Holland. Greenhouse species.

A. penninervis (feather-nerved). *fl.* yellow; heads about the size of a pea, racemose. April. *l.* phyllodia oblong, acuminated at both ends, straight, 2in. to 3in. long, ¼in. broad, feather veined. *h.* 4ft. to 6ft. New Holland, 1824.

A. platyptera (broad-winged).* *fl.* yellow; heads solitary, on short peduncles. March. *l.* phyllodia short, bifarious, decurrent, obliquely truncate, mucronate; branches broadly winged. *h.* 3ft., Swan River, 1840. Greenhouse species.

A. pubescens (downy).* *fl.* yellow; heads small, globose pedicellate, disposed in racemes along the axillary peduncles. March. *l.* with three to ten pairs of pinnæ, each pinna bearing six to eighteen pairs of linear glabrous leaflets. *h.* 6ft. to 10ft. Branches terete, hairy. New Holland, 1790.

A. pulchella (pretty).* *fl.* yellow; heads solitary. April. *l.*, pinnæ bearing five to seven pairs of oblong-ovate, obtuse leaflets. *h.* 2ft. to 3ft. New Holland, 1803. Greenhouse species. The variety *hispidissima* has white flowers.

A. Riceana (Rice's).* *fl.* pale yellow, in long, solitary, axillary spikes. May. *l.* linear, in clusters, dark green, scattered or whorled. *h.* 20ft. Tasmania. Habit graceful, like a weeping willow. Very handsome and distinct. SYN. *A. setigera.* See Fig. 5.

A. rotundifolia (round-leaved). *fl.* yellow; heads globose, solitary, on long peduncles. March. *l.* phyllodia on short petioles, obliquely rounded, obtuse or retuse, mucronate. Branches angular, puberulous. *h.* 6ft. New Holland, 1842.

A. saligna (Willow-like). *fl.* yellow; heads solitary, on short peduncles. March. *l.* phyllodia linear, attenuated at both ends, quite entire, almost nerveless. *h.* 6ft. to 10ft. New Holland, 1818. Greenhouse species.

A. Senegal (Senegal). Gum Senegal. *fl.* white, small, glabrous, distant; spikes axillary, solitary, slender. *l.* with five to eight

Acacia—*continued.*

pairs of pinnæ, each pinna bearing fifteen to eighteen pairs of oblong-linear, obtuse, glabrous leaflets; branches white; prickles sometimes wanting. *h.* 20ft. Arabia, 1823. Stove species.

A. setigera (bristly). Synonymous with *A. Riceana.*

A. sophoræ (Sophora-podded). *fl.* yellow; spikes usually twin, axillary. May. *l.* phyllodia obovate, oblong or lanceolate, quite entire, many nerved; sometimes there are bipinnate leaves at the tops of the branches. *h.* 20ft. New Holland, 1805.

A. sphærocephala (round-headed).* *fl.* yellow; racemes axillary, usually twin, ovate-roundish. *l.* with numerous close-set linear falcate pinnules, which are usually tipped by a glandular yellow "food body;" spines twin, hollow. Mexico. A very remarkable stove species, inhabited by ants during certain seasons in its native country.

A. uncinifolia (hook-leaved). *fl.* yellow; spikes usually twin, dense, on short peduncles, cylindrical. March. *l.* phyllodia long, linear-subulate, flat, recurved, mucronate, three-nerved; branches angular. *h.* 6ft. Swan River, 1846.

A. vera (true). Egyptian Thorn; Gum Arabic. *fl.* white, usually in twin heads, pedunculate, axillary. July. *l.* with two pairs of pinnæ, each pinna bearing eight to ten pairs of oblong linear leaflets; branches and spines red. *h.* 20ft. Egypt, 1596.

FIG. 5. FLOWERING BRANCH OF ACACIA RICEANA.

A. verticillata (whorl-leaved).* *fl.* yellow; spikes axillary, solitary, oblong. March. *l.* phyllodia linear, ending in a pungent mucrone, disposed somewhat verticillately. *h.* 6ft. to 10ft. A spreading, prickly, greenhouse species, of variable habit. New Holland, 1780.

A. vestita (clothed).* *fl.* yellow, in loosely racemose heads, along the peduncles; upper ones solitary. June. *l.* phyllodia obliquely elliptic-lanceolate, one-nerved, ending in an awnlike mucrone, hispid. *h.* 4ft. New Holland, 1820.

A. viscidula (clammy).* *fl.* yellow; heads globular, on short stalks, axillary, solitary or twin. February. *l.* linear, clammy; branches slender, clammy. *h.* 6ft., erect. New South Wales, 1344.

ACÆNA (from *akaina*, a thorn; in allusion to the slender spines on the calyx or fruit). ORD. *Rosaceæ.* A genus of dwarf sub-shrubby plants. Flowers capitate, or interruptedly spicate, uninteresting; petals absent. Leaves alternate, impari-pinnate. Excepting for rockwork, or as edgings to flower beds, they are not of much value; their habit is, however, very compact and neat. They require similar treatment to other hardy herbaceous plants, in ordinary soil. Increased by cuttings, creeping rootlets, divisions, and by seeds.

A. microphylla (small-leaved).* *fl.* green, small, in close heads, furnished with showy, long crimson spines. Summer. *l.* small, pinnate. *h.* 1in. to 2in. New Zealand. A neat evergreen with a compact and cushion-like growth; it is a very effective subject for the rock garden, and grows freely in most situations. The crimson globular heads of spine-formed calyces form a conspicuous and ornamental feature of the plant. SYN. *A. Novæ Zealandiæ.* See Fig. 6.

Acæna—*continued.*

A. millefolia (myriad-leaved).* *fl.* inconspicuous. A very distinct species with finely-cut pale green leaves. The fruiting spikes of this are not collected in globular heads, as in the others, and their presence detract from its value as an ornamental plant. Otherwise, it is very graceful.

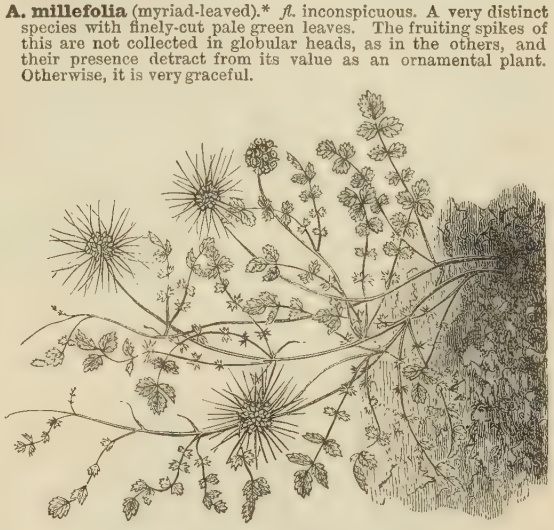


FIG. 6. ACÆNA MICROPHYLLA.

A. myriophylla (many-leaved).* *fl.* green, small, in rounded spikes. June. *l.* pinnate; leaflets deeply cut. *h.* 6in. to 1ft. Chili, 1828 Small, fern-like.

A. Novæ Zealandiæ (New Zealand). A synonym of *A. microphylla.*

A. ovalifolia (oval-leaved). *fl.* green. Summer. *h.* 9in. Chili, 1853. Good for rock gardens.

A. pulchella (pretty).* *fl.* inconspicuous. A pretty bronzy-leaved species, admirably suited for rockwork crevices, where space is no object. It grows very rapidly, and forms handsome tufts.

ACALYPHA (the name given by Hippocrates to the Nettle). ORD. *Euphorbiaceæ.* Stove ornamental and variegated nettle-like leaved shrubs. Flowers greenish or reddish, inconspicuous, in erect or drooping bracted axillary or terminal spikes; those of the upper portion sterile, of the lower, fertile. The undermentioned only are those most worthy of cultivation. They are very easily grown, with ordinary stove treatment, and in a peat and loam compost. When well cultivated, the leaves of the hybridised varieties are highly coloured, but rather coarse than otherwise. Increased by cuttings under a glass in sandy soil, in stove heat, during April.

A. Macafeeana (Macafee's). *l.* red, blotched with bronzy crimson. 1877.

A. macrophylla (large-leaved).* *l.* cordate ovate, russet brown, blotched with paler spots. The best and handsomest stove species.

A. marginata (margined). *l.* large, very hairy, ovate-acuminate, centre brown, with a distinct margin of rosy carmine, about ¼in. wide. Fiji Islands, 1875.

A. musaica (mosaic).* *l.* bronzy green, variegated with orange and dull red. Polynesia, 1877.

A. torta (twisted). *l.* dark olive, tinted green; margin cut into blunt, oblong segments. Samoan Islands. Remarkable for its curiously contorted foliage. It has erect stems, which are terete, and covered by the leaves in a very singular way.

A. tricolor (three-coloured). A synonym of *A. Wilkesiana.*

A. Wilkesiana (Wilkes').* *l.* ovate-acuminate, curiously blotched, mottled, and splashed with red and crimson; ground colour coppery green. *h.* 6ft. to 10ft. New Hebrides, 1866. SYN. *A. tricolor.*

A. W. marginata (Wilkes's margined).* *l.* large, olive brown, margined with rosy carmine. Fiji Islands, 1875.

ACANTHACEÆ. A large order of soft-wooded, herbaceous plants, usually having gamopetalous axillary flowers; calyx composed of deeply imbricated scales; bracts large, leafy.

ACANTHOLIMON (from *akanthos*, a spine, and *limon*, sea lavender). ORD. *Plantagineæ*. Dwarf hardy tufted evergreen plants, distinguished from allied genera in having sharp-pointed rigid leaves. They are of rather slow growth, thriving best in a sandy soil, and sunny position, on rockwork more particularly. The flowers are similar to *Statice* and *Armeria*. Increased by seeds (which germinate slowly), sown carefully on a warm but rather shaded border, and transplanted when large enough to handle; or by cuttings and very carefully made divisions. The cuttings should be made in late summer, and placed in a frame, to remain there during the winter.

A. glumaceum (prickly).* *fl.* rose, spicate, about ¼in. across, six to eight in a spikelet. Summer. *l.* densely packed and sharply pointed with spines. *h.* 6in. Armenia, 1851. Very compact and distinct. SYN. *Statice Araratí*.

A. Kotschyi (Kotschy's). *fl.* white. A good species, but very rarely seen in British gardens.

FIG. 7. ACANTHOLIMON VENUSTUM.

A. venustum (charming).* *fl.* rose, spicate, from twelve to twenty in each spike. Summer. *l.* broader than in the last, and glaucous. *h.* 6in. or 8in. Cilicia, 1873. A rare and handsome alpine. Larger than the preceding. See Fig. 7.

ACANTHOPHIPPIUM (the derivation of this word is not apparent). ORD. *Orchideæ*. A peculiar class of terrestrial stove orchids. Flowers rather large, racemose, few; sepals combined in a broad oblique pitcher, including the petals, which are adnate to the base of the column; column short, produced into a long foot. Pseudo-bulbs oblong. Leaves few, large, longer than the scapes. The best species are the two first-mentioned. They will thrive well in sandy peat, with a quantity of small stones, broken pots, or gravel. A great deal of heat and moisture are absolutely essential during the growing period. Propagated, as soon as growth commences, by dividing the pseudo-bulbs.

A. bicolor (two-coloured).* *fl.* purple and yellow, about 2in. long, campanulate, produced in clusters of three or four together; petals oblong-lanceolate, acutish; lateral lobes of lip rounded. June. *h.* 9in. Ceylon, 1833.

A. Curtisii (Curtis's).* *fl.* same shape as above (except the lip), with numerous purple spots, light rose, and flush; column white, nail of lip yellow, keels yellowish, laciniæ white with purple. Malay Archipelago, 1881. The five keels between the side laciniæ distinguish it from the foregoing species and *A. sylhetense*.

A. javanicum (Javanese).* *fl.* yellow and red, with distinct longitudinal stripes; petals triangular; lip three-lobed; lateral lobes truncate; intermediate lobe constricted in middle, ovate, and tuberculate at the apex, fleshy on both sides at base, with truncate emarginate inflexed teeth. September. *h.* 1½ft. Java, 1843.

A. sylhetense (Sylhet). *fl.* white, with many irregular spots and blotches towards the extremities of the outer portions. June. *h.* 9in. Sylhet, 1837.

ACANTHOPHŒNIX (from *akantha*, a spine, and *phoinix*, the Date Palm). ORD. *Palmæ*. A very elegant stove palm, differing from *Areca* principally in habit, and requiring a light sandy soil and a summer temperature of 65deg. to 80deg., winter 55deg. to 65deg. Increased by seeds only; these germinate best in a moist bottom heat, and a well decomposed compost of one part loam, one of peat, one of leaf mould, and the remainder of sand. They may remain in this soil for two or three years.

A. crinita (hairy).* *fl.* spirally arranged, in threes, the central one being female. *l.* the fronds are arched, broadly ovate in outline, pectinately pinnate in division, with long linear acuminate segments, paler beneath. The stem is densely armed with black, needle-shaped spines, and much swollen towards the base. Seychelles, 1868.

ACANTHORHIZA (from *akantha*, a spine, and *rhiza*, a root). ORD. *Palmæ*. A small genus of stove palms, differing from *Trithrinax* by the aërial roots of the trunk hardening into spines (which are horizontal or pointed upwards), and by the blade of the leaf being divided down to the petiole. They delight in a rich loamy soil, and are propagated by seeds, in a moist, sweet hotbed, in spring.

A. aculeata (spiny).* *l.* orbicular, palmately slit into numerous linear-lanceolate, glabrous segments, deep-green above, silvery beneath; petioles slender; the trunk is covered with a network of branching spines. Mexico, 1879. SYN. *Chamærops stauracantha*.

A. Wallisii (Wallis's).* A recent introduction from tropical America, and not yet much cultivated; it is a tall palm with orbicular palmate leaves.

A. Warzcewiczii (Warzcewicz's).* This differs from the preceding species by its more irregularly divided leaf blade, which is white below. Tropical America.

ACANTHOSTACHYUM (from *akanthos*, a spine, and *stachys*, a spike). ORD. *Bromeliaceæ*. A monotypic genus of stove evergreen herbaceous plants; of easy culture in a compost of equal parts sand, decayed wood, and rotten leaves. Propagated by suckers, which strike readily in bottom heat.

A. strobilacea (cone-fruited). *fl.* red and yellow; scape simple, long, scurfy; bracts coloured. June. *l.* radical, very long, incurved, narrow, thick, pungent, channelled, spiny-toothed, covered with white scurf. *h.* 4ft. Brazil, 1840.

ACANTHUS (from *akanthos*, a spine; several species being spiny or prickly). Bear's Breech. ORD. *Acanthaceæ*. A group of stately, ornamental perennial plants, mostly hardy, remarkable for their vigorous growth and beautiful foliage. Flowers sessile, crowded, spicate; corolla tubular, one-lipped; lip three lobed. To attain perfection they require a deep soil, and a situation fully exposed to the sun. They will, however, thrive moderately well in common soil and partial shade. The habit being generally a bold one, they are most suited for isolated tufts, backgrounds of mixed borders, and the wild garden. Propagated by seeds, sown in gentle heat, or by division of the roots, in autumn or early spring.

A. carduifolius (thistle-leaved). *fl.* blue. August. *h.* 3ft. Cape of Good Hope, 1816. Greenhouse species.

A. hispanicus (Spanish). *fl.* white. August. *l.* large, shining, and deeply cut. *h.* 2ft. Spain, 1700.

A. longifolius (long-leaved).* *fl.* purple, rose, in the axils of the bracts, which are oval, acuminate, spiny, of a reddish hue, forming a spike nearly 1ft. long. June. *l.* radical, 2ft. to 3ft. long; numerous. *h.* 3ft. to 4½ft. Dalmatia, 1869.

A. lusitanicus (Portugal). Synonymous with *A. mollis latifolius*.

A. mollis (soft).* *fl.* white or rose, sessile in the axils of the deeply-toothed bracts; spikes about 1½ft. Summer. *l.* sinuated, unarmed, heart-shaped in outline, 2ft. long by 1ft. broad. *h.* 3ft. to 4ft. Italy, 1548.

A. m. latifolius (broad-leaved).* A variety of *A. mollis*, but larger and more robust in every part. This very handsome form is probably the best grown; it is one of the most suitable for subtropical gardening. A warm sunny spot is needful. SYN. *A. lusitanicus*. See Fig. 8.

A. montanus (mountain).* *fl.* rose. August. *h.* 3ft. West Africa, 1865. A shrubby species.

A. niger (black). *fl.* purplish white. July to September. *l.* sinuated, unarmed, glabrous, shining green. *h.* 3ft. Portugal, 1759.

Acanthus—*continued.*

A. spinosissimus (most spiny).* *fl.* rosy, sessile, on a very handsome spike, with acute, recurved spines. Autumn. *l.* laciniate, pinnatifid, blistered, spiny; spines white. *h.* 3½ft. South Europe, 1629.

FIG. 8. ACANTHUS MOLLIS LATIFOLIUS.

A. spinosus (spiny).* *fl.* purplish, spicate; sepals spiny. Summer. *l.* deeply and regularly cut, each division terminated by a short spine. *h.* 3ft. to 4ft. South Europe. See Fig. 9.

ACAULESCENT. With apparently no stem.

ACCESSORY. Something additional, not usually present.

ACCRETE. Fastened with another body, and growing with it.

ACCUMBENT. Lying against anything, in distinction to *incumbent*, or lying upon.

ACER (from *acer*, hard or sharp; wood is extremely hard, and was formerly much used for making pikes and lances). Maple. ORD. *Sapindaceæ*. A genus comprised, for the most part, of handsome hardy deciduous shrubs, or trees, adapted for forming shrubberies, plantations, &c. Flowers greenish, except where mentioned. *A. Pseudo-platanus* is one of our most useful forest trees. Several of the species produce very useful timber; sugar is one of the constituent parts of the sap of all of them, and is obtained in large quantities from *A. saccharinum*, in North America. They all prefer a somewhat sheltered position. The most satisfactory soil is one free, deep, loamy, and well drained; the latter is especially desirable with some of the Japanese varieties. The varieties of *A. japonicum*, and *palmatum* are well worth growing in pots for conservatory decoration. Propagation: By seeds, sown either in autumn or spring, covering them not more than a ¼in. deep; the common varieties may be sown outside, while the rarer ones should be sown in a frame. By layers, and by grafting; the latter method is adopted with many of the rarer species

Acer—*continued.*

and varieties, especially the variegated kinds; they are also readily increased by budding in summer.

A. austriacum (Austrian). Synonymous with *A. campestre austriacum.*

A. campestre (field).* Common Maple *fl.* on erect racemes. May. *fr.* wings of fruit much divaricated. *l.* small, cordate, with five-toothed lobes. *h.* 20ft. Britain. A small tree with rough bark, full of deep fissures; wood often beautifully veined, when it is highly valued.

A. c. austriacum (Austrian).* *fl.* much larger than those of the species. *fr.* smooth. Lobes of leaves somewhat acuminated. SYN. *A. austriacum.*

A. c. collinum (hill-loving).* *fl.* smaller. *fr.* smooth. Lobes of leaves obtuse. France.

A. c. hebecarpum (downy-fruited).* *fr.* clothed with velvety pubescence.

FIG. 9. LEAF AND FLOWER SPIKE OF ACANTHUS SPINOSUS.

A. c. lævigatum (smooth-leaved). *l.* very smooth and shining.

A. c. nanum (dwarf). Dwarf habit.

A. c. tauricum (Taurian).* *l.* larger and less divided than in the species.

A. c. variegatum (variegated).* *l.* beautifully variegated with blotches and stripes of white or whitish yellow; very distinct.

A. circinatum (circinate).* *fl.* deep red, umbellate. April. *l.* seven to nine-lobed, serrulated. *h.* 5ft. to 6ft. North West

Acer—*continued.*

America, 1827. A very beautiful species, having pendulous branches clothed with leaves, which change into a bright scarlet colour in the autumn.

A. creticum (Cretan). *fl.* on few-flowered erect corymbs. May. *fr.* smooth, with the wings hardly diverging. *l.* cuneated at the base, acutely three-lobed at the top. *h.* 4ft. Levant, 1752. Nearly evergreen.

A. dasycarpum (thick-fruited).* *fl.* conglomerate, on short pedicels, apetalous. April. *l.* truncate at the base, palmately five-lobed, with blunt recesses, and unequally and deeply-toothed lobes. *h.* 40ft. North America, 1725. SYNS. *A. eriocarpon, A. tomentosum, A. glaucum,* and *A. virginianum*

A. Douglasii (Douglas). Synonymous with *A. glabrum.*

A. eriocarpon (hairy-fruited). Synonymous with *A. dasycarpum.*

A. Ginnala (Ginnalian).* *fl.* on compound, crowded, erect racemes. Amur River. This is generally classed as a variety of *A. tartaricum,* but its habit is much more graceful, and in this form the leaves are prettily cut and lobed, whilst the leafstalks and midrib are more deeply coloured.

A. glabrum (smooth).* *fl.* corymbose, on short two-leaved branchlets, greenish-yellow. June. *l.* roundish-cordate, deeply three to five-lobed, or partite; the lobes bi-serrate, of a light green. *h.* 15ft. to 30ft. North West America. SYNS. *A. Douglasii, A. tripartitum.*

A. glaucum (glaucous). Synonymous with *A. dasycarpum.*

A. heterophyllum (various-leaved).* *fl.* corymbose. May. *l.* small, ovate, entire, and three-lobed, slightly serrated, smooth, *h.* 4ft. Levant, 1759. An evergreen. SYN. *A. sempervirens.*

A. ibericum (Iberian). *fl.* corymbose. May. *l.* bluntly three-lobed; lobes with one or two teeth, lateral ones marked with the middle nerve to the insertion of the petiole. *h.* 20ft. Iberia, 1826.

A. japonicum (Japanese).* *fl.* deep purplish-red, large. April. *l.* many-lobed, in early spring very light green. *h.* 20ft. Japan, 1863. The varieties of this species, although not well fixed in many cases, rank amongst the most handsome of the deciduous small shrubs grown, but often change in character as they attain any considerable size. Plants from 1½ft. to 3ft. high are very useful in cool conservatories, and in the highly kept grounds surrounding the house.

A. laurifolium (laurel-leaved). Synonymous with *A. oblongum.*

A. Lobelii (Lobel's). *l.* very slightly heart-shaped, irregularly toothed, five-lobed; lobes more or less abruptly pointed.

A. macrophyllum (large-leaved).* *fl.* on erect, compound, racemes. May. *l.* digitately five-palmate, with roundish recesses; lobes somewhat three-lobed. *h.* 60ft. Northern California, 1812.

A. monspessulanum (Montpellier).* *fl.* on few-flowered corymbs, erect. May. *l.* cordate, three-lobed; lobes almost or quite entire, equal. *h.* 10ft. to 20ft. South Europe, 1739.

A. montanum (mountain). *fl.* on compound, erect racemes, May. *l.* cordate, three or slightly five-lobed, unequally and coarsely serrated. *h.* 18ft. Canada, 1750. SYN. *A. spicatum.*

A. Negundo. *See* **Negundo aceroides.**

A. oblongum (oblong). *fl.* on compound racemes, pale yellow. February. *l.* oblong-lanceolate, acuminated, quite entire. *h.* 20ft. Nepaul, 1824. SYN. *A. laurifolium.*

A. obtusifolium (obtuse-leaved). *fl.* drooping, corymbose. May. *l.* rounded, bluntly three-lobed, crenately serrulate, about the length of the petioles. *h.* 15ft. Crete.

A. Opalus (Opalus). A synonym of *A. opulifolium.*

A. opulifolium (Guelder-rose-leaved).* *fl.* on nearly sessile corymbs. May. Ovaries and fruit smooth. *l.* cordate, five-lobed; lobes obtuse, bluntly and coarsely toothed *h.* 8ft. France, 1823. SYN. *A. Opalus.*

A. o. obtusatum (bluntish).* A larger, strong growing, round-headed tree, with dark green leaves, which are covered with a whitish or rusty tomentum on the under surface.

A. palmatum (palmate-leaved).* *fl.* on five to seven-flowered umbels. May. *l.* palmately divided into five to seven lobes beyond the middle; lobes oblong, acuminated, serrated. *h.* 20ft. Japan, 1820.

A. p. atropurpureum (dark purple).* A vigorous handsome plant, with bold dark purple foliage. Japan.

A. p. crispum (crispy or waved).* *l.* green, with red stalked, convoluted edges. Japan, 1871. Very distinct, and like a miniature Lombardy poplar in habit of growth.

A. p. dissectum (finely-divided).* *fl.* red, on terminal-stalked racemes, five to six-flowered. May. *l.* nine to ten parted; lobes oblong, acuminated, deeply serrated. *h.* 30ft. Japan, 1845.

A. p. ornatum (beautiful).* Very ornamental, having finely cut deep red leaves, with lighter midribs. Japan, 1871. This variety is also known as *dissectum.*

A. p. palmatifidum (palmatifid).* *l.* very finely palmately divided, the lobes cut down quite to the midrib, of a beautiful light green colour. 1875.

Acer—*continued.*

A. p. reticulatum (netted).* *l.* palmately seven-lobed; lobes unequal, sharply serrate, emerald green, with dark green veins. Japan, 1875. A very elegant variety, with slender branches.

A. p. roseo-marginatum (rose-margined).* *l.* freely divided, the lobes deeply cut, light green, margined with rose. Japan, 1874. A very distinct and charming variety.

A. p. sanguineum (blood-red).* *l.* deeply five-lobed, the lobes serrated, of a deep reddish-crimson colour, much brighter than the variety *atropurpureum.* 1874. This presents a very striking contrast to the last.

A. p. septemlobum (seven-lobed).* *fl.* purplish, on numerous flowered umbels. Spring. *l.* varying much, from palmately five-lobed, with toothed undivided lobes, to deeply seven to nine-lobed, with more or less finely cut divisions. Japan, 1864. There are numerous beautiful forms of this variety.

There are many varieties of this much varying species, but we have only mentioned those best known; many are only known by their native names, and there is some doubt as to their distinctive characteristics. They are all extremely handsome.

A. pennsylvanicum (Pennsylvanian).* *fl.* in long drooping, simple racemes. May. *l.* cordate, three-lobed, acuminated, finely and acutely serrated. *h.* 20ft. Trunk elegantly striped with white lines. North America, 1755. SYN. *A. striatum.*

A. pictum (painted).* *fl.* corymbose, stalked. *l.* five to seven-lobed; lobes triangular or oblong, entire, acuminated. *h.* 15ft. to 20ft. Temperate Asia, 1840. *A. p. connivens* (converging), *A. p. marmoratum* (spotted), *A. p. rubrum* (red), and *A. p. variegatum* (variegated), are varieties differing principally in the colouring of the leaves. All are very desirable.

A. platanoides (plane-like).* The Norway Maple. *fl.* on nearly erect stalked corymbs. May, June. *l.* cordate, smooth, five-lobed; lobes acuminated, with a few coarse acute teeth. *h.* 50ft. Europe, 1683. A very ornamental hardy tree, growing with great rapidity when young. It prefers a deep, well-drained soil.

A. p. aureo-variegatum (golden-variegated).* *l.* variegated with yellow. Europe, 1383. This, to retain the variegation, requires to be propagated by budding or grafting. The same remarks are equally applicable to the other varieties.

A. p. laciniatum (cut-leaved).* *l.* deeply and variously cut, green and yellow.

A. p. Schwedleri (Schwedler's).* *l.* very large, deep bronzy-red. A vigorous grower, and most effective.

A. p. variegatum (variegated).* *l.* variegated with white. There are several other varieties, but of less importance than the foregoing.

A. Pseudo-platanus (Mock-plane tree).* Sycamore. *fl.* on rather compound pendulous racemes. May. *l.* cordate, with five acuminated unequally-toothed lobes. *h.* 30ft. to 60ft. Europe. There are few deciduous trees so well adapted for standing singly in rough exposed situations. A deep, soft, dry soil is most suitable for it, but it will grow in soils of very opposite qualities.

A. P. albo variegata (white-variegated).* A very beautiful form, in spring especially. *l.* white and green.

A. P. flavo variegata (yellow-variegated). *l.* variegated with yellow.

A. P. longifolia (long-leaved).* *l.* more deeply cut, and the petioles much longer than in the species.

A. P. purpureum (purple).* *l.* purple underneath. The tree, when slightly ruffled by the wind, alternately appearing clothed in purple and pale green. Numerous other varieties of more or less excellence are grown.

A. rubrum (red).* Scarlet Maple. *fl.* scarlet, handsome, conglomerate, corymbose. *l.* cordate at the base, deeply and unequally toothed, palmately five-lobed, with acute recesses. Branches and fruit also scarlet. *h.* 20ft. Canada, 1656. A variety with leaves splashed with yellow is rare. An excellent species, thriving well in damp, swampy situations, and is commonly increased by layers.

A. rufinerve (red-nerved).* "The leaves vary both in size and outline, from 2½in. to 4in. each way; three to five-lobed, with irregularly toothed margins, glabrous above, but with reddish hairs along the nerves beneath. The young branches are conspicuous on account of the bluish-grey glaucescence with which they are covered."

A. r. albo-limbatum (white-margined)* differs only from the species in having a very distinct white margin—not always constant. Japan, 1869.

A. saccharinum (Sugar Maple).* *fl.* yellow, on drooping corymbs, on short peduncles; pedicels pilose. April. *l.* cordate, smooth, palmately five-lobed; lobes accuminated, sinuately toothed. *h.* 40ft. N. America, 1735.

A. s. nigrum (blackish).* *fl.* on sessile corymbs, nodding. April, May. *l.* cordate, with the recess closed; palmately five-lobed. *h.* 40ft. North America, 1812.

Acer—*continued.*

A. Semenovi (Semenov's).* A slender and graceful species, with leaves closely resembling those of *A. Ginnala*, but smaller. Turkestan, 1879.

A. sempervirens (evergreen). Synonymous with *A. heterophyllum.*

A. spicatum (spiked). Synonymous with *A. montanum.*

A. striatum (striated). Synonymous with *A. pennsylvanicum.*

A. tartaricum (Tartarian).* *fl.* white, on crowded, erect, compound racemes. May. *l.* more or less cordate, acuminated, serrated, with obsolete lobes. *h.* 20ft. 1759. This species is one of the first to expand its leaves in spring.

A. tomentosum (tomentose). Synonymous with *A. dasycarpum.*

A. tripartitum (three-parted). Synonymous with *A. glabrum.*

A. Van Volxemii (Van Volxem's). *fl.* not known in England. *l.* palmately three to five-lobed, very large, light green above, silvery and quite glabrous beneath. Caucasus, 1877. Distinct and fine.

A. villosum (hairy). *fl.* fragrant, on lateral racemes. April. Buds, fruit, and young leaves, silky, villous. *l.* cordate, five-lobed, villous beneath as well as the petioles; lobes ovate acute. *h.* 50ft. Himalaya, at high elevations. Not hardy.

A. virginianum (Virginian). Synonymous with *A. dasycarpum.*

ACERACEÆ. An order of very ornamental hardy trees, of which the Sycamore and Maple are well-known representatives.

ACERAS (from *a*, without, and *keras*, a horn; the lip having no spur). ORD. *Orchideæ*. An interesting genus of terrestrial orchids. Calyx of three ovate, equal, converging sepals; petals two, narrow, oblong; lip spurless, much longer than the calyx, narrow, oblong, with four linear lobes. The most interesting species is the native one. Indigenous to dry, chalky pastures in the south-east of England, and it will only thrive in similar soils when grown in gardens. Propagated by careful divisions of tubers only.

FIG. 10. FLOWER OF ACERAS ANTHROPOPHORA.

A. anthropophora (man-bearing). Green Man Orchis. *fl.* greenish, on a long spike; lip longer than the ovary; lip and petals often margined with red. June. *l.* lanceolate. *h.* 1ft. See Fig. 10.

ACERATIUM (from *a*, not, and *keras*, a horn; the stamens being destitute of the terminal bristles so conspicuous in its near ally, *Elæocarpus*). ORD. *Tiliaceæ*. An interesting stove evergreen tree, very closely allied to *Tilia*. It thrives well in a mixture of loam and peat, and is increased by ripe cuttings, which root readily if placed in sand, under a hand glass, in heat.

A. oppositifolium (opposite-leaved).* *fl.* white, on terminal three-flowered peduncles. June. *l.* opposite, elliptic-oblong, furnished with a few mucronated teeth. *h.* 20ft. Amboyna, 1818.

ACEROSE, ACEROSUS. Needle-pointed, fine, and slender, with a sharp point.

ACETARIOUS. An adjective applied to plants used in salads.

ACEUS. A termination expressing a resemblance to the thing whose name it terminates—*foliaceus*, leaf-like, of the texture of a leaf or *folium*.

ACHANIA. *See* **Malvaviscus.**

ACHENE. A hard, dry, one-seeded, superior seed-vessel.

ACHERONTIA ATROPOS. *See* **Sphinx Atropos.**

ACHILLEA (named after Achilles, who is said to have first discovered the medicinal qualities of this plant). Including *Ptarmica*. Milfoil. ORD. *Compositæ*. A large genus (about fifty species), containing numerous hardy, border and alpine plants. Flower-heads small, corymbose; involucral scales oblong, often with a shrivelled appearance; receptacle with membranous scales, resembling chaff; ray florets few, sometimes rather large and showy; pappus none. Leaves ternate, simple or compound. All the species are easily cultivated in ordinary garden soil. *A. Eupatorium* and other large-growing kinds are well suited for borders or groups, whilst the alpine section should be planted on the rockery. A great number of species, although excellent for naturalising in rough shrubberies, are totally unfitted for garden culture. Propagated, during spring, by root divisions, cuttings, and seeds.

Achillea—*continued.*

A. ægyptiaca (Egyptian).* *fl.-heads* rich bright yellow, in closely packed terminal corymbs, which are from 2in. to 4in. across. Summer. *l.* pinnate; leaflets obtusely lanceolate, serrate, silvery white, 6in. to 8in. long. *h.* 1½ft. to 2½ft. Levant, 1640. Handsome perennial, thriving best in a warm position.

A. Ageratum (Ageratum-leaved).* *fl.-heads* pure white, large, borne singly on stalks about 6in. or 8in. high. Summer. *l.* narrow, arranged in a dense silvery rosette, the margins prettily crimped. Greece. A pretty alpine, of compact habit.

A. asplenifolia (Asplenium-leaved).* *fl.-heads* rose-coloured, small, in a compound corymb. June to September. *l.* lower ones stalked, pinnatifid, lobes pinnate; upper ones pinnate. *h.* 18in. North America, 1803.

A. atrata (black-cupped).* *fl.-heads* white. August *l.* in a rosette, pinnatifid, deep shining green. Austria, 1596. A pretty alpine.

A. aurea (golden-flowered).* *fl.-heads* golden yellow, borne singly on stems 18in. high. Summer and autumn. *l.* larger than in *A. ageratifolia*, with which species it is sometimes confused. Levant, 1739. Habit tufted. Requires a warm position.

FIG. 11. ACHILLEA CLAVENNÆ, showing Habit and detached Flower-head.

A. Clavennæ (Clavenna's).* *fl.-heads* white, in neat and compact heads. Spring and summer. *l.* bi-pinnatifid; segments linear, obtuse, slightly denticulated at the apex. *h.* 10in. Austria, 1656. A very neat and pretty species, having dwarf tufted habit and a hoary appearance. See Fig. 11.

A. decolorans (staining). *fl.-heads* whitish yellow. July. *l.* undivided. *h.* 1ft. Native country unknown. 1798.

FIG. 12. ACHILLEA EUPATORIUM, showing Habit and detached Flower-head.

A. Eupatorium (fern-leaved).* *fl.-heads* brilliant yellow, in dense convex, compound corymbs, which are often 5in. across, lasting two months in full beauty. June to September. *l.* numerous, linear, pinnate, lobed and serrated, hairy, rough. *h.* 4ft. to 5ft. Caucasus, 1803. This noble plant should be grown at the back of the border, and kept neatly staked. SYN. *A. filipendula*. See Fig. 12.

A. filipendula (Dropwort-leaved). Synonymous with *A. Eupatorium.*

Achillea—*continued.*

A. Herba-rota (Herba-rota).* *fl.-heads* white, in lax corymbs, on slender stems. May. *l.* lanceolate, serrated. *h.* 6in. France, 1640. When touched, this pretty little plant gives off an agreeable aromatic perfume. To attain full beauty it requires sandy loam and a sunny position.

A. macrophylla (large-leaved). *fl.-heads* white. July. *l.* long and broad pinnate; leaflets horizontal. *h.* 3ft. Italy, 1810.

A. Millefolium roseum (rosy).* *fl.-heads* rose-coloured, in small ovoid heads, which are produced continuously for several months. *l.* strap-shaped; segments very narrow. *h.* 1ft. to 3ft. England. It is well worth growing, both as a border plant, and for cutting purposes.

A. mongolica (Mongolian). *fl.-heads* white. July. *l.* undivided. *h.* 1½ft. Siberia, 1818.

A. moschata (musky).* *fl.-heads* white, in lax corymbs. June. *h.* 6in. *l.* bright green, about 2in. long, pinnatifid. Italy, 1775. A pretty tufted alpine.

A. nana (dwarf). *fl.-heads* white. June to August. *l.* pinnate; leaflets horizontal. *h.* 6in. Italy, 1759. A rockery species.

A. odorata (sweet-scented). *fl.-heads* white, fragrant. June to August. *l.* bipinnate. *h.* 6in. Spain, 1729.

A. pectinata (comb-leaved).* *fl.-heads* white. June. *l.* bright green, about 2in. long, pinnatifid. Italy, 1775. A pretty tufted alpine.

A. Ptarmica flore-pleno (double sneezewort).* *fl.-heads* pure white, freely produced in terminal corymbs. All through the summer and autumn. *l.* lanceolate, serrulate. *h.* 1ft. to 2ft. England This is one of the most useful white border perennials grown, increasing very readily. When out of flower the stems should be cut down to the surface.

A. santolinoides (Lavender-cotton-like). *fl.-heads* white. July. *l.* pinnate; leaflets transverse. *h.* 1ft. Spain.

A. serrata (serrated).* *fl.-heads* clear white, large, in small corymbose clusters, forming a somewhat spreading panicle. Summer. *l.* white, with adpressed hairs, sessile, lanceolate, deeply serrated. *h.* 15in. Switzerland, 1686.

FIG. 13. ACHILLEA TOMENTOSA, showing Habit and detached Portion of Inflorescence.

A. tomentosa (downy).* *fl.-heads* bright yellow, in repeatedly compound corymbs. Summer. *l.* woolly, bipinnatifid; segments linear, acute. *h.* 8in. to 12in. Europe. One of the best yellow-flowered species for the rock garden, having a dense habit. See Fig. 13.

A. umbellata (umbel-flowered).* *fl.-heads* white, six to eight in a simple umbel. June. *l.* regularly lobed; lobes obovate, entire; clothed with a dense, silvery pubescence, on which account the plant is chiefly cultivated. *h.* 4in. to 5in. Greece. A very pretty, dwarf rock plant.

A. vallesiaca (Vallesian). *fl.-heads* white. June to August. *l.* pinnate; leaflets horizontal. *h.* 1ft. Switzerland, 1819.

ACHIMENES (from *cheimaino*, to suffer from cold; alluding to the general tenderness of the species). Including *Scheeria*. ORD. *Gesneraceæ*. A large genus of handsome, stove or warm greenhouse, branched, generally hairy, herbaceous perennials, with scaly, catkin-like stolons underground (see Fig. 14), and sometimes from the axils of the leaves. Corolla funnel-shaped; tube rather oblique, gibbous behind at the base; pedicels one-flowered, axillary, solitary or fasciculated, bracteated. Leaves opposite, or three in a whorl, serrated.

To be successfully cultivated, they must be started and grown in stove heat till they commence flowering, when they may be removed to the conservatory or greenhouse, there to remain till after flowering. Batches of tubercles should be started in heat from February till the end of April, so as to give a succession of blossom. Shake each variety out of the old compost and insert separately in light, sandy soil; water sparingly at first, but when active they may receive more frequent supplies. When the shoots

Achimenes—*continued.*

are about 2in. high, the tubercles may be transplanted to the pots, pans, or baskets in which it is intended to grow them, using as potting compost fibrous peat and leaf-soil in equal proportions, with about a sixth part of sheep's or rotten cow manure, and sufficient silver sand to make the whole porous and of a whitish appearance. Thorough drainage is indispensable, and a layer of the rougher soil, or sphagnum, should be placed over the potsherds, to pre-

FIG. 14. ROOT OF ACHIMENES, showing Tubercles.

vent the loose soil stopping the drainage. Place the pans as near the glass as possible, and shade from bright sunshine. Give liberal supplies of water, with occasional doses of liquid manure; and, as the shoots lengthen, they may be pinched, to induce sturdy growth and a larger number of flowering branches. Place neat stakes to each stem, and keep well tied, arranging the stakes as symmetrically as possible, so as to ensure an even outline, but

FIG. 15. BOUQUET OF VARIOUS ACHIMENES.

do not allow them to be seen. Light syringing with clear water, morning and evening, is beneficial. After the plants have done flowering, they should gradually have less water as the foliage and stems decay; a light airy situation is needed to mature and ripen the tubers. When the tops are quite dead, they may be removed, and the pots stored on the sides in any warm dry corner where

Achimenes—*continued.*

the temperature will not fall below 50deg., keeping the plants quite dry until the time of starting again. Achimenes are liable to attacks of thrips, red-spider, and green-fly, especially if the atmosphere is kept dry; these are easily destroyed by fumigation with tobacco. This must only be done when the foliage is quite dry, otherwise the plants will suffer. Achimenes are especially beautiful when well arranged, especially if two or three varieties are mixed together, as white, red, and purple (Fig. 15). There are several methods of increasing these:—(1) By cuttings; these need not be cut off at a joint, as they will root from any portion of the stem. Insert them thickly in well-drained pots of sandy soil—say a mixture of equal parts of peat and sand—and place in bottom heat. (2) By leaves, which should be severed from the stems, and pricked in pots of similar soil to the cuttings, placing all the petiole below the surface; stand the pots in bottom heat. (3) By scales from the corms, which should be carefully rubbed off and sown, like seeds, in pots or pans of the same compost, barely covered with sand, and placed in bottom heat. (4) By seeds, which are very small, and, consequently,

FIG. 16. FLOWER OF ACHIMENES LONGIFLORA.

require to be carefully sown. The pans must be thoroughly drained and filled nearly to the rim, levelled, and well watered with a fine rose, after which the seed should be thinly scattered, covered very lightly with sand, and placed in a shady position. Keep nicely moist, and apply water very lightly, or the tiny germs will be disturbed. Place a sheet of glass over the seed-pans. When the seedlings are large enough to handle, they may be pricked off and afterwards treated like rooted cuttings. The best time for all modes of propagating is early spring.

A. atrosanguinea (dark-crimson).* *fl.* crimson; tube of corolla 1½in. long, cylindrical, saccate at base, pilose; limb small, spreading; peduncle one-flowered. July, August. *l.* pilose, oblong, sub-cordate, serrated, unequal. *h.* 1½ft. Guatemala, 1848.

A. candida (white).* *fl.* white; tube of corolla gibbous at base; limb oblique, the front segment largest; peduncles axillary, pilose, three-flowered. June. *l.* unequal, oblique at base, serrated, pilose. *h.* 1½ft. Guatemala, 1848.

A. coccinea (scarlet).* *fl.* scarlet; peduncles solitary, axillary. August. *l.* three in a whorl, ovate, acuminated, serrated, with minute leaves in the axils. *h.* 1½ft. Jamaica, 1778.

A. cupreata (coppery). *fl.* scarlet; calyx spotted inside, with a fringed mouth; petals ciliately toothed; peduncles one-flowered. April. *l.* elliptic, serrated, wrinkled, coloured. *h.* 6in. Mexico, 1845. Plant creeping, downy.

A. gloxiniæflora (Gloxinia-flowered).* *fl.* whitish, large, axillary; tube of corolla 2in. long; limb broad, spreading; lobes finely serrated, dotted with purple inside. June. *l.* serrated from middle to top. Stem slender, flexuous. *h.* 1ft. Mexico, 1845.

Achimenes—*continued.*

A. grandiflora (large-flowered).* *fl.* violet purple, very large, solitary, axillary; limbs of corolla spreading. June. *l.* equal, ovate, oblique at base, sparingly serrated. *h.* 1½ft. Mexico, 1842.

A. heterophylla (various-leaved). *fl.* solitary or twin; corolla scarlet; lobes ciliated. July. *l.* opposite, one smaller than the other, cordate ovate, acuminated, coarsely serrated. *h.* 1ft. Mexico. Plant rather hairy.

A. hirsuta (hairy). *fl.* reddish, with yellow eye; limb of corolla flat, with rounded serrulate segments; peduncles one-flowered. July. *l.* cordate, serrated. *h.* 2½ft. Stem bulbiferous. Guatemala, 1842. Plant hairy.

A. Kleei (Klee's).* *fl.* lilac; corolla dark near the mouth, with a dash of yellow in the throat; calyx downy; peduncles one-flowered. August. *l.* ovate, acuminate, serrated. *h.* 6in. Guatemala, 1848. Plant hairy.

A. longiflora (long-flowered).* *fl.* violet; segments of calyx lanceolate, erect; corolla with a long tube, and an ample spreading limb; pedicels one-flowered. July and August. *l.* three to four in a whorl, ovate or oblong, coarsely serrated. *h.* 1ft. Guatemala, 1841. Plant hairy. See Fig. 16.

A. multiflora (many-flowered).* *fl.* pale lilac; sepals linear; corolla funnel-shape; tube curved; lobes roundish, lower one fringed; peduncles axillary, three to five-flowered. August. *l.* opposite, or three in a whorl, ovate, deeply and doubly serrated. *h.* 1ft. Brazil, 1843. Plant hairy.

A. ocellata (eye-spotted).* *fl.* reddish yellow, with dark spots, solitary, drooping; petals nearly equally spotted. Autumn. *l.* on longish petioles, ovate, acuminate, serrated, wrinkled, coloured beneath. *h.* 1½ft. 1845. Plant hairy.

A. patens (spreading). *fl.* violet, blue; calyx downy; tube of corolla shorter than limb, which is spreading. June. *l.* ovate, acuminate, hispid above, serrate. *h.* 1ft. Mexico, 1845.

A. pedunculata (long-stalked).* *fl.* scarlet, with yellow eye; corolla drooping, gibbous at base; peduncles in the axils of the upper leaves. July. *l.* rather unequal, obliquely cordate, ovate, serrated. *h.* 2ft. Stem simple, downy. Guatemala, 1840.

A. picta (painted).* *fl.* scarlet, with yellow eye; tube of calyx turbinate; lobes of corolla roundish, three lower ones smallest; peduncles solitary or two-flowered, axillary one-flowered July. *l.* opposite, or three in a whorl, cordate-ovate, coarsely serrated, velvety, and elegantly painted. *h.* 1½ft. Mexico, 1845.

A. rosea (rosy). *fl.* rose, pilose; limb of corolla equal to tube; peduncles filiform, many-flowered, June. *l.* sometimes three in a whorl, pilose. *h.* 1½ft. Guatemala, 1848.

The foregoing are the most important species known. Hybrid varieties are innumerable, and even surpass the species in beauty, the best of which are enumerated below in their respective colours.

Blue and Purple Flowered. ADVANCE,* flowers reddish-purple, lighter at the eye, dwarf, and free habit; ARGUS,* rich plum, with deep orange eye, large and free; DR. BUENZOD,* flowers rich crimson purple, spotted with orange in the centre, very free; EXCELSIOR, rich violet-purple, very large and free, with compact habit; GEM,* flowers small, of good form, rich carmine-purple; GIBSONI,* flowers very large, clear mauve, with the tube white outside; GRANDIS, rich violet purple, with large orange eye, carmine shaded, a charming variety; LADY SCARSDALE,* flowers of fair size, very free, rich plum purple, shaded carmine; LONGIFLORA MAJOR,* a stronger grower than the type, freely producing large rich blue flowers, one of the finest varieties grown; MADAME GEORGE, deep purple shaded crimson; MAUVE QUEEN,* flowers very large, of a distinct mauve, with a brownish eye-shade, very profuse, with a grand habit, one of the best; PURPUREA ELEGANS,* deep claret purple, orange throat with dark spots, a very attractive variety; ROLLISONII,* flowers large, deep lavender-blue, yellow throat, spotted with deep crimson, very effective; VIVICANS,* dark carmine-purple, with crimson eye, a few blue rays streaking from the eye, habit good, and very free.

Crimson and Scarlet Flowered. AURORA,* rich rosy-scarlet, with yellow throat, very large, fully 2in. across; CARL WOOLFORTH,* deep crimson, shaded lighter at the eye, very free; DAZZLE, flowers small, brilliant scarlet, pale yellow eye, very pretty and free; DIADEM*, crimson lake, shaded carmine, with deep yellow eye; ECLIPSE,* rich orange-scarlet, spotted with carmine, extremely floriferous, with a good habit; FIREFLY,* deep carmine red, golden eye, spotted with crimson, one of the best; HARRY WILLIAMS*, bright cerise red, yellow, maroon spotted, the edge prettily fringed, a very charming variety; LOVELINESS, rich magenta crimson, golden eye, spotted with maroon; METEOR, flowers rather large, bright crimson-scarlet, yellow eye, spotted carmine, very dwarf and free; SCARLET PERFECTION,* rich carmine-scarlet, deep orange eye, very beautiful; SIR TREHERN THOMAS,* deep crimson-lake, very profuse, with a good habit; STELLA, deep magenta, with orange eye, the margins fringed, very large and free, 2in. or more across; WILLIAMSII,* flowers large, stout, brilliant scarlet, orange throat, habit dwarf and free-branching, one of the finest varieties grown.

Orange-Flowered. GEORGIANA DISCOLOR, flowers large, bright orange, with a distinct yellow centre; HENDERSONI,* rich orange-

Achimenes—*continued.*

salmon, with yellow eye; MAGNET,* deep orange, spotted with crimson, with a distinct carmine zone, a very free-flowering and beautiful variety; PARSONSI* is a decided improvement upon the last.

Rose-Flowered. ADMIRATION, deep rose, white throat, spotted with carmine; CARMINIATA SPLENDENS,* bright rose yellow, spotted in the centre, a charming variety; LEOPARD, bright magenta rose, freely spotted at the throat; LONGIFLORA ROSA,* rich lilac rose, deeper in centre, of medium size, very free and dwarf; MASTERPIECE,* deep rose, violet shaded, with a distinct white throat; PINK PERFECTION,* rich rose, the eye rich carmine and violet rayed, one of the best; ROSEA MAGNIFICA,* bright rose, with a yellow eye, very finely spotted, a very lovely variety; ROSE QUEEN,* flowers very large, rich rosy-lake, shaded deep purple, with a well defined orange throat; UNIQUE,* rosy-pink, deep yellow eye, spotted crimson, a very charming variety.

White-Flowered. AMBROSE VERSCHAFFELT,* flowers of good size, pure white, with a dark rayed centre; LONGIFLORA ALBA,* similar in form and habit to Longiflora, but with large white flowers, slightly marked in the centre; MADAME A. VERSCHAFFELT,* flowers large, pure white ground, heavily veined with purple, a very attractive variety; MARGARETTA,* flowers of medium size, pure white, and destitute of any markings whatever.

ACHLAMYDEOUS. Without floral envelopes.

ACHRAS. *See* **Sapota.**

ACHYRANTHES. *See* **Chamissoa** and **Iresine.**

ACHYRONIA. Included under **Priestleya** (which *see*).

ACHYROPAPPUS. Included under **Schkuhria** (which *see*).

ACICULAR. Needle-shaped.

ACINETA (from *akineta*, immovable; the lip being jointless). ORD. *Orchideæ*. A small genus of cool house, robust, sub-terrestrial orchids allied to *Peristeria*. Flowers sub-globose, fleshy, arranged on stout, pendulous racemes. Leaves lanceolate, membranous, ribbed. Pseudo-bulbs angular, about as large as hens' eggs The compost should consist of equal parts of fibrous peat and living sphagnum. In planting, first place a somewhat thick layer of the moss all round the inside of the basket, and press the soil firmly round the plant. During the growing season, the baskets should be taken down twice or three times a week and dipped into a tub of water, so that the whole may become saturated. In addition, the plants should be sprinkled with the syringe morning and evening, for they delight in an abundant supply of water and plenty of shade. When the growth is finished, they must be kept very dry, an occasional syringing, to keep the leaves from shrivelling, being all that is necessary.

A. Arcei (Arce's). *fl.* yellow. Central America, 1866.

A. Barkeri (Barker's).* *fl.* yellow and dark crimson, on stout scapes, produced from the base of the bulbs, and bearing fifteen to thirty fragrant flowers. Midsummer. *l.* broadly lanceolate, 2ft. long. Pseudo-bulbs 5in. to 7in. long. Mexico, 1837. SYN. *Peristeria Barkeri.*

A. chrysantha (yellow-flowered).* *fl.* yellow, white, and crimson, fragrant; lower part of the lip having a blunt, papillose horn; racemes erect. May. *h.* 2ft. Mexico, 1850.

A. densa (dense-flowered).* *fl.* sub-globose, and of a waxy consistence, lemon-yellow, dotted brown, sweet-scented; racemes rather short. Costa Rica, 1849. A robust-growing species, very like *A. Barkeri.* SYN. *A. Warczewiczii.*

A. Humboldtii (Humboldt's).* *fl.* straw-colour, dotted with brown; scapes 2ft. long. May. *l.* broadly lanceolate, generally four. Columbia, 1872. A handsome species, but the flowers speedily fade. SYNS. *Anguloa superba, Peristeria Humboldtii fulva.*

A. sulcata (grooved). *fl.* bright yellow. Columbia, 1879. Very like the last species, from which it differs in mere botanical detail.

A. Warczewiczii (Warczewicz's). A synonym of *A. densa.*

ACINOS. *See* **Calamintha.**

ACIOTIS (from *akis*, a point, and *ous*, an ear; in allusion to the shape of the petals). ORD. *Melastomaceæ*. A small genus of pretty, stove, evergreen plants. Flowers small; panicles slender, loose, terminal; petals four, obliquely awned at the apex. Leaves thin, membranous. For culture, *see* **Melastoma.**

A. aquatica (water-loving). *fl.* white, small, on loose, terminal, filiform panicles. June. *l.* cordate, ovate-oblong. *h.* 6in. to 12in.

Aciotis—*continued.*

South America, 1793. The pots in which this species is grown should be kept in pans of water.

A. discolor (various-coloured).* *fl.* small, red, in spicate racemes. *l.* petiolate, elliptic-oblong, purple beneath, deep shining green above. *h.* 1ft. Trinidad, 1816.

ACIPHYLLA (from *ake*, a point, and *phyllon*, a leaf, referring to the sharply pointed segments of the leaf). ORD. *Umbelliferæ*. A genus of curious and remarkable erect hardy perennials, with densely fascicled, spicate, or panicled umbels of flowers; and pinnate or bi-tripinnate leaves. They are most suited for the rockwork, in a light sandy soil. Propagated by seeds or divisions in spring.

A. Colensoi (Colenso's).* *fl.* white. This extraordinary evergreen forms a circular bush, 5ft. or 6ft. in. diameter, of bayonet-like spines, having flowering stems 6ft. to 9ft. high, covered with spreading spinous leaflets. New Zealand, 1875.

A. squarrosa (rough-headed).* *fl.* white. *h.* 6ft. to 9ft. New Zealand. More frequently met with than the preceding, of very dense growth. Commonly known as the Bayonet Plant.

ACIS (named after Acis, shepherd of Sicily, son of Faunus and the nymph Simæthis). ORD. *Amaryllideæ*. A genus of very pretty dwarf bulbous plants, suitable for the rockery, in sunny sheltered situations. This genus was formerly included under *Leucoium*, from which it is distinguished by its dwarf slender habit, filiform style, and membranous capsule. All are delicate little plants, with narrow-linear leaves and bell-shaped flowers. They require a free, open, rich soil, and should remain and blossom undisturbed for years; divide the clumps every three or four years, and renew the soil.

A. autumnalis (autumn-flowering).* *fl.*, perianth white, delicate pink at the base, preceding the leaves; two to three on a stem. Autumn. *l.* few in number, very slender, sheathing the stems at the base. *h.* 4in. to 6in. Portugal, 1629. A charming species, and the only one at all common.

A. grandiflorus (large-flowered).* *fl.*, perianth white, larger than those of the last. August. *h.* 6in. Numidia, 1820. Somewhat rare in cultivation.

A. roseus (rose-coloured).* *fl.*, perianth rose red, not more than ¼in. long; scape one to three-flowered. August. *l.* narrow, blunt, linear. *h.* 3in. Corsica, 1820. Very rare.

A. tingitanum (Tangiers). Of recent introduction; has a many-flowered umbel, and very long leaves.

A. trichophyllus (hair-leaved).* *fl.*, perianth white, about ¼in. long; segments loosely nerved, with a faint flush of red at the base. January. *h.* 6in. Spain, 1820.

ACISANTHERA (from *akis*, a point, and *anthera*, an anther; anthers jointed). ORD. *Melastomaceæ*. A monotypic stove genus allied to Rhexia, of semi-shrubby habit. It grows well in a mixture of loam, sand, and peat; and cuttings root freely in the same soil in stove temperature.

A. quadrata (square-branched). *fl.* purple, ventricose, alternate, axillary, solitary. July. *l.* three-nerved, ovate, crenated; branches square. Habit erect, branched at the apex. *h.* 1ft. to 1½ft. Jamaica, 1804. More curious than ornamental.

ACMADENIA (from *akme*, a point, and *aden*, a gland; in allusion to the anthers being terminated by pointed glands). ORD. *Rutaceæ*. A small genus of beautiful greenhouse shrubs. Flowers terminal, solitary, or few, furnished with imbricate sepal-like bracts; petals five, with long claws, which are bearded on the inside. Leaves imbricate, linear-oblong, or roundish. They thrive best in a mixture of peat and sand, with a little turfy loam; thorough drainage is also necessary. Young cuttings pricked in a pot of very sandy soil, covered with a bell glass, and shaded, will root freely in a cool house.

A. tetragona (four-angled).* *fl.* white, large, sessile, solitary. June. *l.* roundish-rhomboidal, with scabrous margins. *h.* 1ft. to 2ft. Cape of Good Hope, 1798.

ACMENA (from *Acmenæ*, nymphs of Venus, who had an altar at Olympia). ORD. *Myrtaceæ*. A small genus of greenhouse evergreen shrubs. Flowers in dense trichotomous cymes, with five small distant petals, and very conspicuous and pretty berries. They grow well in an equal mixture of peat, loam, and sand. Propagated readily by placing half-ripened cuttings in sand, under a glass, without heat.

Acmena—*continued.*

A. floribunda (many-flowered).* *fl.* white, in threes, disposed in a terminal panicled thyrse. May to September. *l.* full of pellucid dots, oval-lanceolate, acuminated at both ends. Berries globose, bright purple. *h.* 4ft. New Holland, 1790.

A. ovata (ovate-leaved).* A new species, having, according to Mr. W. Bull, ovate leaves, which, along with the stems and petioles, are dark purple, giving the plants, when making new growth, a striking appearance. It has a neat habit.

ACOKANTHERA. *See* **Toxicophlœa.**

ACONIOPTERIS. *See* **Acrostichum.**

ACONITE. *See* **Aconitum.**

ACONITE, WINTER. *See* **Eranthis.**

ACONITUM (from *Aconæ*, or *Acone*, a harbour of Heraclea, in Bithynia, near where it is said to abound). Aconite; Monk's Hood; Wolf's Bane. ORD. *Ranunculaceæ.* An extensive genus of very ornamental hardy perennials. Flowers in terminal racemes; sepals five, the upper one helmet shaped, the two sides broader than the two back ones; petals five, small, the two upper with long claws hooded at the tip; the three inferior smaller or undeveloped. Leaves palmate. They thrive well in any ordinary garden soil. If left undisturbed for several years, they will attain a goodly size, and produce fine panicles of handsome flowers. They are invaluable for growing beneath the shade of trees, where they succeed better than almost any other class of plants. All are very easily propagated by divisions of the roots and seeds; the latter should be sown as soon as ripe in a cold frame. Care should be taken not to leave pieces of the roots about, for, with but one exception, those of all the species are very poisonous. Although very unlike horse-radish, they have frequently been mistaken for it, with fatal results; and none of the species should be cultivated in or near the kitchen garden.

Sect. I. Roots Tuberous.

A. acuminatum (taper-pointed). *fl.* bluish purple; spur capitate; helmet closed, conical, beaked. July. *l.* with cuneate, bipinnate lobes. *h.* 2ft. to 4ft. Switzerland, 1819.

A. album (white-flowered).* *fl.* pure white, large, with erect helmet, very freely produced. *l.* dark green, with oblong-cuneate divisions. August. *h.* 4ft. to 5ft. Levant, 1752. This is a rare and very handsome species.

A. alpinum (alpine). Synonymous with *A. rostratum.*

A. amplifiorum (large-flowered). *fl.* bluish-purple, large; spur obtuse, straight. June. *l.* with blunt segments. *h.* 2ft. to 3ft. Austria, 1823.

A. angustifolium (narrow-leaved).* *fl.* deep blue, in spiked panicles; spur capitate; helmet closed, hemispherical; lip bifid. June. *l.* palmately cut into linear lobes. *h.* 2ft. to 3ft. Siberia, 1824.

A. biflorum (twin-flowered).* *fl.* pale blue, usually twin, sessile, the middle rather obscure and with yellowish edges, covered on the back with spreading down; spur truncate; helmet depressed; beak drawn out. June. *l.* lower ones on long stalks, with linear segments. *h.* 6in. Siberia, 1817. A very rare alpine species.

A. Cammarum (Cammarum). *fl.* rich deep purple, on rather loose spikes; spur capitate; helmet closed, hemispherical. July to September. *l.* with short, bluntish lobes. *h.* 3ft. to 4ft. Austria, 1752.

A. cernuum (drooping). *fl.* violet, large, on nodding, loose, hairy racemes; spur capitate, or a little hooked; helmet large, arched, beaked. July and August. *l.* with trapeziform, pinnate lobes. Branches axillary, spreading. *h.* 3ft. to 4ft. Europe, 1800.

A. delphinifolium (Delphinium-leaved).* *fl.* pale bluish purple, large, on loose racemes; spur a little hooked; helmet hemispherical. June. *l.* smooth, deeply cut into five parts. Stems slender. *h.* 6in. to 2ft. North America, 1820. A rare alpine species.

A. elatum (tall). *fl.* blue, very large, in loose panicled spikes; peduncles pubescent; spur capitate, inclining. June. *l.* with linear acute segments. *h.* 3ft. to 4ft. Europe, 1822.

A. eminens (eminent).* *fl.* blue, on erectly spreading pubescent peduncles; spur capitate; helmet closed; lip very long, refracted. June. *l.* with cuneate bipinnate lobes. *h.* 2ft. to 4ft. Europe, 1800.

A. eriostemon (woolly-stamened). *fl.* bluish-purple, disposed in long, beautiful, erect-spreading spikes; spur capitate; helmet closed, arched. June. *l.* with cuneate, bipinnate lobes. *h.* 4ft. Switzerland, 1821.

A. exaltatum (exalted). *fl.* blue, on loose panicles, with ascending stiff branches; spur thick, somewhat hooked; helmet conical; beak elongated. July. *l.* with trapeziform, pinnate lobes. *h.* 6ft. Pyrenees, 1819. SYN. *A. hamatum.*

Aconitum—*continued.*

A. flaccidum (flaccid). *fl.* pale violet, large, on erect spreading peduncles; racemes branched; spur hooked at the apex; helmet high, arched, inclining forwards, gaping. July and August. *l.* multifid, ciliated (as well as the petioles), when young. *h.* 6ft. Siberia, 1822.

A. gibbosum (swollen). Synonymous with *A. nasutum.*

A. Gmelini (Gmelin's). *fl.* cream-coloured, middle-sized, on very long loose racemes; spur straight, obtuse; bottom of the helmet rounded, cylindrical. July. *l.* on long stalks, villous beneath and shining above; lobes divided into narrow segments. *h.* 2ft Siberia, 1817. SYN. *A. nitidum.*

A. gracile (slender).* *fl.* pale blue or violet, large, on loose racemes; spur erect, clavated-hooked; helmet with a middle sized beak. June. *l.* smooth, with trapeziform, pinnate lobes. Stems slender. *h.* 2ft. Italy, &c.

A. Halleri (Haller's).* *fl.* opaque violet, on elongated, loose racemes, with a few lateral ascending ones; spur capitate; helmet convex-hemispherical, gaping. June. *l.* lobes linear, dilated, very long. Stem straight, long, branched. *h.* 4ft. to 6ft. Switzerland, 1821.

A. H. bicolor (two-coloured).* *fl.* white, variegated with blue-disposed in spikes or panicles. June.

FIG. 17. FLOWER OF ACONITUM NAPELLUS, nearly Full Size.

A. hamatum (hooked). Synonymous with *A. exaltatum.*

A. hebegynum (blunt-styled). Synonymous with *A. paniculatum.*

A. heterophyllum (various-leaved). *fl.* pale yellow, and deep blue in front, large, numerous, dense. August. *l.* petiolate below, sessile above, broadly cordate, coarsely toothed at the edge, and deep green. *h.* 2ft. Himalayas, 1874. A new introduction, said to be non-poisonous, and used as a tonic in India.

A. illinitum (anointed). *fl.* pale or deep violet, on very loose and much branched panicles, large; spur thick, long, abruptly pointed; beak blunt; helmet sub-conical. July. *l.* with broad cuneiform lobes, and obtuse lobules. *h.* 4ft. 1821.

A. intermedium (intermediate). *fl.* blue, on a loose panicle, with ascending stiff branches; spur supine, somewhat hooked; helmet arched. June. *l.* with trapeziform, pinnate lobes. *h.* 3ft. to 4ft. Alps of Europe, 1820.

A. japonicum (Japanese).* *fl.* flesh-coloured, on loose panicles, with ascending branches; helmet exactly conical, abruptly mucronate; beak acute, straight. July to September. *l.* stalked, trifid; lateral lobes bifid, middle lobe trifid, all blunt and deeply toothed. Stem round, smooth. *h.* 6ft. Japan, 1790. One of the best species grown.

A. j. cœruleum (blue). *fl.* blue. Japan.

A. laciniosum (jagged). *fl.* pale blue, or with a white base, large, on somewhat contracted racemes; spur clavated-hooked;

Aconitum—*continued.*

helmet arched, conical. June. *l.* with jagged, trapeziform pinnate lobes. *h.* 3ft. Switzerland, 1820.

A. lycoctonum (true Wolf's-bane).* *fl.* livid-violet, rather large; racemes more or less pubescent, branched at the base; bottom of helmet cylindrical; beak elongated. July. *l.* large, seven-parted. Stem slender, simple, upright. *h.* 4ft. to 6ft. Europe, 1596.

A. maximum (largest). *fl.* pale blue; panicle loose, furnished with a few long distant, few-flowered, pubescent branches; spur short, incurved; helmet hemispherico-conical, obtuse. July. *l.* multifid, large, smooth. *h.* 6ft. Kamtschatka, 1823.

A. meloctonum (Badger's-bane). *fl.* cream-coloured, loose, pubescent; panicle large, with diverging branches; spur arched; bottom of helmet conico-cylindrical. July. *l.* five to seven-parted, deep green. *h.* 2ft. to 4ft. Piedmont, 1821.

A. Meyeri (Meyer's). *fl.* bluish purple, on pubescent peduncles; spur capitate, inclining. June. *l.* with cuneate bipinnate lobes. *h.* 2ft. to 4ft. Bavaria, 1823.

A. molle (soft). *fl.* violet, large, puberulous; racemes panicled, pubescent; helmet irregularly conical, obtuse; front erect; spur capitate, or a little hooked. June. *l.* smooth, with trapeziform, pinnate lobes. *h.* 2ft. to 6ft. 1820.

FIG. 18. ACONITUM NAPELLUS showing Root, Seed-pod, Raceme, Leaf, and Flower with Sepals removed.

A. Napellus (little turnip).* Common Monk's Hood. *fl.* blue, large, on a large terminal raceme; peduncles erect, pubescent; spur capitate; helmet convex-hemispherical, gaping, smoothish; lip revolute. Summer. *l.* pedately five-lobed. *h.* 3ft. to 4ft. There are a great number of varieties of this species cultivated and introduced. The following are some of the names representing slightly varying forms which have, however, been regarded as species by Reichenbach and other authors: *acutum, amœnum, Bernhardianum, Braunii, callibotryon, Clusianum, commutatum, firmum, formosum, Funkianum, hians, Hoppeanum, Kœhleri, lætum, laxiflorum, laxum, Mielichhoferi, napelloides, neomontanum, neubergense, oligocarpus, rigidum, strictum, tenuifolium, venustum, virgatum.* One of the most virulent of poisonous plants, both to cattle as well as human beings; and, notwithstanding its eminently handsome appearance, it should only be planted in places where no danger is likely to arise from its presence. See Figs. 17 and 18.

A. nasutum (great-nosed). *fl.* violet; panicle contracted, quite smooth; spur elongated, arched; helmet conical, bending forward; beak short. June. *l.* with broad, trapeziform, pinnate lobes. *h.* 3ft. Caucasus, &c., 1818. SYN. *A. gibbosum.*

A. nitidum (shining). Synonymous with *A. Gmelini.*

A. Ottonianum (Otto's).* *fl.* blue, variegated with white; young peduncles nodding; spur supine, somewhat hooked; helmet arched. July, August. *l.* with trapeziform, pinnate lobes. *h.* 2ft. to 4ft. Carpathian Mountains. 1824.

A. paniculatum (paniculate).* *fl.* large, violet; panicle terminal, much branched, loose or contracted, more or less pubescent; helmet conical, beaked; front sinuate. June to September.

Aconitum—*continued.*

l. smooth, with trapeziform, pinnate lobes. *h.* 2ft. to 3ft. France and Switzerland, 1815. SYN. *A. hebegynum.*

A. plicatum (folded). Synonymous with *A. tauricum.*

A. productum (long-lipped). *fl.* violet, downy, on few-flowered, loose, pubescent racemes; helmet straight, irregularly convex-conical, with a drawn-out beak; spur capitate. June. *l.* on long stalks with three-parted lobes. *h.* 1ft. Siberia.

A. rostratum (beaked).* *fl.* violet; panicle rather loose; spur thick, depressed, globose; helmet conical, elongated, abruptly pointed in front; beak stretched out. June. *l.* with trapeziform, pinnate lobes. *h.* 1ft. to 2ft. Switzerland, 1752. SYN. *A. alpinum.*

A. Schleicheri (Schleicher's). *fl.* blue or violet, middle sized, on short racemes; spur capitate; helmet convex-hemispherical, gaping, smoothish. Summer. *l.* with finely jagged lobes. Stem straight (or infracted), simple, slender. *h.* 2ft. to 3ft. Europe. SYN. *A. vulgare.*

A. semigaleatum (half-helmeted). *fl.* pale blue, pubescent when young, on very loose racemes; peduncles elongated; spur hooked; helmet convex, navicular. June. *l.* multifid, few, membranous, smooth; root about the size and form of a pea. *h.* 6in. to 2ft. Kamtschatka, 1818.

A. Sprengelii (Sprengel's). *fl.* bluish purple; spur obtuse, straight. June. *l.* with blunt, bipinnate lobes. *h.* 3ft. to 4ft. Europe, 1820.

A. tauricum (Taurian).* *fl.* deep blue, disposed in dense racemes; peduncles erect, smooth; lateral sepals smooth inside; spur blunt; helmet closed, hemi-spherical. June. *l.* segments almost pedately disposed and divided into linear acuminate lobes. *h.* 3ft. to 4ft. Germany, 1752. SYN. *A. plicatum.*

A. tortuosum (twisting). *fl.* pale or deep violet, large; panicle loose, few flowered; spur thick, long, abruptly pointed (neither arched, nor convolute). July. *l.* smooth, with narrow wedge-shaped lobes, and acute lobules. *h.* 6ft. to 8ft. North America, 1812.

A. toxicum (very poisonous). *fl.* violet, large, pubescent, on loose, also pubescent, racemes; spur hooked; helmet large, arched, with a blunt beak. June. *l.* smooth, with trapeziform pinnate lobes. Stem flexuous, almost simple. *h.* 2ft. America, 1825.

A. uncinatum (hooked).* *fl.* generally lilac, large, smooth; racemes loose, rather umbellate at the apex, very rarely panicled; spur somewhat spiral, inclined; helmet regularly conical, compressed. July. *l.* with trapeziform pinnate lobes. Stem with branches rising from the axils of the leaves. *h.* 4ft. to 8ft. North America, 1768.

FIG. 19. ACONITUM VARIEGATUM, showing Habit and Flower.

A. variegatum (variegated).* *fl.* blue, large, smooth; racemes panicled, loose; spur erect, clavated-hooked; helmet bent forward, inflated; beak ascending. July. *l.* lower, on long stalks; upper, sessile, smooth, thickish. *h.* 1ft. to 6ft. Europe, 1597. See Fig. 19.

A. v. albiflorum (white-flowered).* *fl.* white, small; helmet straight.

A. v. bicolor (two-coloured).* *fl.* white, edged with blue or lilac; helmet straight.

A. vulgare (common). A synonym of *A. Schleicheri.*

A. Willdenovii (Willdenow's).* *fl.* bluish-purple; peduncles pubescent; spur obtuse, straight. June. *l.* with blunt segments. *h.* 2ft. to 3ft. Carniola, 1823.

Sect. II. Roots Fibrous or Napiform.

A. Anthora (Anthora).* *fl.* pale yellow; panicles generally pubescent; spur refracted; lip obcordate; helmet arched. July. *l.* palmately cut into linear lobes. *h.* 1ft. to 2ft. Pyrenees, 1596. The following varieties of *A. Anthora* are erroneously classed as species by some authors:

Aconitum—*continued.*

A. A. Decandollii (Decandolle's). *fl.* yellow; panicle and flowers pubescent; helmet rather conical, bent, with a short, abrupt, and acuminated beak. *l.* with rather large dark green lobes. Alps of Jura, 1873.

A. A. eulophum (well-crested). *fl.* yellow; panicles and flowers puberulous; helmet conical. Caucasus, 1821.

A. A. grandiflorum (large-flowered). *fl.* yellow, large; panicle, flowers, and fruit pubescent; helmet rather conical. Alps of Jura, 1821.

A. A. Jacquinii (Jacquin's). *fl.* yellow, smooth; helmet somewhat conical, drawn out into an elongated beak.

A. A. nemorosum (grove-loving).* *fl.* yellow; panicle and flowers pubescent; helmet somewhat conical, bent; beak short. *l.* with broad lobes.

A. autumnale (autumn-flowering).* *fl.* bluish-purple, in loose panicles; peduncles rigidly spreading; spur capitate; helmet closed; lip very long, refracted. July. *l.* with cuneate, bipinnate lobes. *h.* 3ft. to 4ft. Europe.

A. barbatum (bearded).* *fl.* cream coloured, middle sized; racemes dense, puberulous; spur straightish, obtuse; bottom of helmet conical; middle sepals densely bearded. July. *l.* opaque, with the lobes divided into many linear segments, on long stalks, which are villous as well as the nerves. *h.* 2ft. to 6ft. Siberia, 1807. SYN. *A. squarrosum.*

A. chinense (Chinese).* *fl.* intense and very bright blue, in large compound racemes; pedicels slightly hairy above. Summer. *l.* lower ones large, deeply cut into three wedge-shaped segments, tapering at the base; upper ones sessile, gradually becoming more entire. *h.* 4ft. to 6ft. China, 1833.

A. Lamarckii (Lamarck's). *fl.* cream-coloured, pubescent; racemes long, cylindrical, crowded, branched at the base; spur spiral; helmet constricted, clavate. July. *l.* large, seven to nine-parted, with the lobes unequally cleft. *h.* 2ft. to 3ft. Pyrenees, 1800.

A. lupicidum (Wolf's-bane). Synonymous with *A. Vulparia.*

A. macrophyllum (large-leaved). *fl.* yellow, numerous, panicled; spur arched; helmet large, somewhat ventricose at the apex. July. *l.* large, more or less dissected. *h.* 4ft. to 8ft. Germany.

A. Nuttallii (Nuttall's). Synonymous with *A. ochroleucum.*

A. ochroleucum (yellowish-white).* *fl.* cream coloured, large; spur arched; bottom of helmet conico-cylindrical; middle sepals covered with short hairs; racemes puberulous, rather loose. July. *l.* five to seven-parted, deep green, the first ones are puberulous above. *h.* 2ft. to 4ft. Russia, 1794. SYNS. *A. Nuttallii, A. pallidum.*

A. Pallasii (Pallas'). Probably a mere variety, with a continuous spur, of *A. anthora.*

A. pallidum (pale). Synonymous with *A. ochroleucum.*

A. pyrenaicum (Pyrenean).* *fl.* yellow, rather large; spur hooked; bottom of helmet cylindrical, rounded; racemes elongated, dense, puberulous. June. *l.* parted almost to the base, with pinnatifid lobes, rather hispid beneath, but smooth above, on long stalks. *h.* 2ft. Pyrenees, &c., 1739.

A. squarrosum (rough). Synonymous with *A. barbatum.*

A. vulparia (Fox-bane).* *fl.* pale yellow, smooth; spur spiral; helmet cylindrical, large; beak stretched out, acute; racemes crowded. July. *l.* three or five-lobed, ciliated. *h.* 1ft. to 3ft. Europe, 1821. SYN. *A. lupicidum.* The principal varieties of this species are:—

A. v. carpaticum (Carpathian). *fl.* panicled, of a lurid colour, sometimes variegated with yellow; helmet conico-cylindrical, compressed; peduncles smooth. *l.* profoundly cut. Stems smooth. *h.* 2ft. to 3ft. Carpathian Mountains, 1810.

A. v. Cynoctonum (tall Dog's-bane). *fl.* (and stem) yellow, smoothish, numerous, panicled. *h.* 3ft. to 4ft. France, 1820.

A. v. moldavicum (Moldavian). *fl.* violet, panicled; helmet cylindrical, compressed. *h.* 3ft. to 4ft. Moldavia.

A. v. rubicundum (reddish). *fl.* livid violet, panicled, villous, variegated with yellow; helmet conico-cylindrical, compressed. *h.* 2ft. to 3ft. Siberia, 1819.

A. v. septentrionale (northern).* *fl.* blue, panicled, villous; helmet conico-cylindrical, compressed. *h.* 4ft. North Europe, 1800.

ACONTIAS. *See* **Xanthosoma.**

ACORN. The seed or fruit of the oak. *See* **Quercus.**

ACORUS (from *a*, without, and *kore*, the pupil of the eye; in allusion to its reputed medicinal qualities). ORD. *Aroideæ* (*Araceæ*). A small genus of hardy herbaceous plants. Flowers on a sessile spadix; perianth six-cleft, inferior, persistent. The species thrive best in a moist soil, and are very suitable for the banks of water, or even as aquatics in shallow water. Propagated easily by divisions during spring.

A. Calamus (sweet-flag).* *fl.* yellowish, small, borne on a cylindrical spadix 4in. to 6in. long. Summer. *l.* sword-shaped.

Acorus—*continued.*

erect, striated 3ft. long. The root is cylindrical, channelled, and very fragrant. Europe. The variety with gold-striped leaves is more useful as a decorative plant. See Fig. 20.

FIG. 20. ACORUS CALAMUS.

A. gramineus (Grass-leaved). China, 1796. This is much smaller in all its parts than the above, but very pretty.

A. g. variegatus (variegated).* A pretty variety with white-striped leaves, forming handsome little tufts.

ACOTYLEDONS. Plants having no cotyledons, or seed leaves, as in *Cuscuta*, but usually applied to cryptogamic or flowerless plants, such as Ferns, Mosses, &c.

ACRADENIA (from *akra*, top, and *aden*, a gland; referring to the five glands on the top of the ovary). ORD. *Rutaceæ.* An excellent, neat, and compact evergreen bush, suitable for the cool conservatory. It requires a rich loam and leaf mould. Propagated by seeds, and by cuttings, inserted under a bell glass.

A. Franklinіæ (Lady Franklin's).* *fl.* white, produced in great profusion, in terminal clusters. August. *l.* fragrant, opposite, trifoliolate, gland-dotted. *h.* 8ft. Tasmania, 1845.

ACRE (from *agros*, an open field). The English Statute Acre consists of 160 square rods (perches, poles, or lugs); or 4840 square yards; or 43,560 square feet. The following list shows the differentiation in the number of square yards per acre in the various districts of Great Britain and Ireland: Cheshire, 10,240; Cornish, 5760; Cunningham, 6250; Derby (W.), 9000; Devonshire, 4000; Herefordshire, 3226⅔; Irish, 7840; Leicestershire, 2308¾; Scotch, 6150; Wales, North (customary), 3240; ditto (erw), 4320; Westmoreland, 6760; Wiltshire, 3630.

ACRIDOCARPUS (from *akris*, a locust; and *karpos*, fruit; meaning not obvious). ORD. *Malpighiaceæ.* A handsome sub-tropical or warm greenhouse climber, requiring plenty of water, and a very free drainage. Increased by imported seeds, and by cuttings in bottom heat.

A. natalitius (Natal).* *fl.* pale yellow; petals five, rounded, wedge-shaped, crenately-toothed at the edge; racemes simple, elongated, terminal. July. *l.* oblong or obovate, obtuse, leathery. Natal, 1867.

ACRIOPSIS (from *akros*, top, and *opsis*, eye). ORD. *Orchideæ.* A small genus of pretty stove epiphytal orchids, almost unknown to cultivation. Flowers small, arranged in loose panicles; lip adnate to the very curious column, from which it projects at right angles.

A. densiflora (crowded-flowered).* *fl.* green and pink. May. *l.* linear-lanceolate. *h.* 6in. Borneo, 1845.

A. javanica (Javanese). *fl.* yellow, green. May. *l.* linear-lanceolate. *h.* 3in. Java, 1840.

A. picta (painted).* *fl.* white, green, and purple. May. *l.* solitary, linear. *h.* 6in. Bantam, 1843.

ACROCLINIUM (from *akros*, top, and *klinē*, a bed; referring to the open flowers). ORD. *Compositæ.* A small genus of elegant half hardy annuals with "everlasting" flower heads, which are solitary, terminal, and consist of

Acroclinium—*continued.*

tubular florets; involucrum many-leaved, imbricated. Leaves numerous, linear, smooth, acuminated. Stems numerous, erect. They thrive best in a loamy soil, and constitute very neat summer flowering annuals if sown out of doors in patches in June; they are also useful as winter decorative greenhouse plants if seed is sown in August in pots placed in a cold frame. The flower-heads should be gathered when young, if it is desired to preserve them.

FIG. 21. ACROCLINIUM ROSEUM, showing Habit and Flower-head.

A. roseum (rosy).* *fl.-heads* pretty rose, solitary, terminal, on erect, slender, and gracefully disposed branches. *l.* linear, acute. *h.* 1ft. to 2ft. S. W. Australia, 1854. See Fig. 21.

A. r. album (rosy white).* A very pretty white form of the preceding.

A. r. grandiflorum (large-flowered).* *fl.-heads* rose, larger than in the type.

ACROCOMIA (from *akros*, top, and *kome*, tuft; referring to the position of the leaves). ORD. *Palmæ*. A genus of South American palms, containing about eleven species, which are not easily distinguished, but having the following general characteristics: Trunk from 20ft. to 50ft. high, and clad with long prickles. The flowers, which appear in the axils of the lower leaves, are greenish or yellow, and their drupes are much the same colour. Leaves pinnate, with seventy to eighty leaflets on each side of the pinnæ. They require a warm greenhouse and rich sandy loam. Increased by suckers. Two species only are in general cultivation.

A. aculeata (prickly). *h.* 40ft. West Indies, 1791.

A. fusiformis (spindle-shaped). *h.* 40ft. Trinidad, 1731.

A. globosa (globular). *h.* 20ft. St. Vincent, 1824.

A. horrida (horrid). *h.* 30ft. Trinidad, 1820.

A. lasiospatha (hairy spathed). *l.* drooping. Trunk about 40ft. high, smooth and ringed. Para, 1846.

A. sclerocarpa (hard-fruited).* A very elegant species bearing a head of spreading pinnate leaves, with the rachises and petioles aculeate, and the leaflets linear, taper-pointed, glaucous underneath, about 1ft. long. *h.* 40ft. West Indies, 1731. SYN. *Cocos fusiformis.*

A. tenuifolia (narrow-leaved) *h.* 30ft. Brazil, 1824.

ACROGENS. Plants increasing at the summit, as Ferns, &c.

ACRONYCHIA (from *akron*, tuft, and *onux*, a claw; referring to the curved points of the petals). ORD. *Rutaceæ*. An ornamental rue-like greenhouse evergreen shrub. Petals and sepals four; stamens eight, inserted on a disk; fruit berry-like. It requires ordinary greenhouse treatment. Increased by cuttings in July in sand, under a bell glass.

A. Cunninghami (Cunningham's).* *fl.* white, in clusters, resembling those of an orange, with an exquisite fragrance. July. *h.* 7ft. Moreton Bay, 1838.

ACROPERA. *See* **Gongora.**

ACROPHORUS. *See* **Davallia.**

ACROPHYLLUM (from *akros*, top, and *phyllon*, a leaf; referring to the way in which the leaves are produced at the summit of the branches, above the flowers). ORD. *Cunoniaceæ*. Handsome greenhouse small, erect-growing, evergreen shrubs, flowering profusely during the spring months. They require a mixture of fibrous peat, a little loam, and sharp sand; thorough drainage, an airy situation, and as little artificial heat as possible, are important to its well-being. Re-pot in February. Propagated by cuttings of the half ripened shoots, which strike freely in a soil of sand and peat, if covered with a hand glass, and placed in a cool house. The roots should not be allowed to get dry, and light syringing during late spring and summer will be found beneficial in assisting to keep down thrips.

Acrophyllum—*continued.*

A. verticillatum (whorled). A synonym of *A. venosum.*

A. venosum (veined).* *fl.* pinkish white, in dense axillary spikes, which are borne on the upper part of the stems and branches. May and June. *l.* nearly sessile, oblong, cordate, acute, serrate, in whorls of threes. *h.* 6ft. New South Wales. SYN. *A. verticillatum.*

ACROPTERIS. *See* **Asplenium.**

ACROSTICHUM (from *akros*, top, and *stichos*, order; meaning very obscure). ORD. *Filices*. This genus includes *Aconiopteris*, *Chrysodium*, *Egenolfia*, *Elaphoglossum*, *Gymnopteris*, *Olfersia*, *Photinopteris*, *Pœcilipteris*, *Polybotrya*, *Rhipidopteris*, *Soromanes*, *Stenochlæna*, *Stenosemia*. A large and almost entirely tropical genus; it includes groups with a wide range in venation and cutting. Sori spread over the whole surface of the frond or upper pinnæ, or occasionally over both surfaces. The species having long fronds are admirably suited for growing in suspended baskets, and the dwarfer sorts do well in Wardian cases. A compost of peat, chopped sphagnum, and sand, is most suitable. For general culture, *see* **Ferns.**

A. acuminatum (taper-pointed).* *rhiz.* thick, climbing. *sti.* 4in. to 6in. long, firm, erect, scaly throughout. *barren fronds* 1ft. to 2ft. long, 1ft. or more broad, deltoid, bipinnate; upper pinnæ oblong-lanceolate, slightly lobed, truncate on the lower side at the base, 2in. to 3in. long, ¾in. to 1in. broad; lower pinnæ, 6in. to 8in. long, 4in. to 5in. broad, with several small pinnules on each side; light green, with a firm texture. *fertile fronds* 1ft. long, deltoid, tripinnate. Brazil. Stove species. SYN. *Polybotrya acuminatum.*

A. alienum (foreign). *rhiz.* woody. *sti.* 6in. to 18in. long, scaly downwards. *barren fronds* 1ft. to 2ft. long, often 1ft. broad, the upper part deeply pinnatifid, with lanceolate lobes, the lower part pinnate, with entire or deeply pinnatifid lower pinnæ. *fertile fronds* much smaller, with distant narrow linear or pinnatifid leafy pinnæ. Tropical America. Stove species. SYN. *Gymnopteris aliena.*

A. apiifolium (Parsley-leaved).* *cau.* stout, woody, erect. *sti.* of barren fronds 2in. to 3in. long, erect, densely clothed with tomentum. *barren fronds* 4in. to 6in. each way, deltoid, tripinnate; pinnæ close, only the lowest pair with pinnatifid pinnules, ultimate divisions oblong-rhomboidal, ¼in. to ½in. long, the base cuneate, the outer edge slightly toothed. *fertile fronds* on a slender naked stem 6in. to 8in. long, the fronds panicled with a few distant, slender, simple, or compound branches. Philippine Islands, 1862. Stove species. SYN. *Polybotrya apiifolia.*

A. apodum (stemless).* *cau.* thick, woody, the scales dense, linear, brown, crisped. *sti.* tufted, very short, or obsolete. *barren fronds* 1ft. or more long, 1½in. to 2in. broad, the apex acuminate, the lower part narrowed very gradually, the edge and midrib densely fringed with soft, short, brown hairs. *fertile fronds* much smaller than the barren ones. West Indies to Peru, 1824. Stove species. SYN. *Elaphoglossum apodum.*

A. appendiculatum (appendaged).* *rhiz.* firm, woody. *barren fronds* 6in. to 18in. long, 4in. to 8in. broad, simply pinnate. *sti.* 3in. to 6in. long, erect, naked, or slightly scaly; pinnæ 2in. to 4in. long, ⅜in. to ¾in. broad, the edge varying from sub-entire to cut halfway down to the midrib of the blunt lobes, the upper side often auricled, the lower one obliquely truncate, dark green. *fertile fronds* narrower, on a longer spike, the pinnæ roundish or oblong, often distinctly stalked. India, &c., 1824. Stove species. SYN. *Egenolfia appendiculata.*

A. aureum (golden).* *cau.* erect. *sti.* erect, 1ft. to 2ft. long, strong. *fronds* 2ft. to 6ft. long, 1ft. to 2ft. broad, the upper pinnæ fertile, rather smaller than the barren ones, which are usually stalked, ligulate oblong, 3in. to 1ft. long, ½in. to 3in. broad, acute or blunt, sometimes retuse with a mucro; edge quite entire, base sub-cuneate. Widely distributed in the tropics of both hemispheres, 1815. An evergreen aquatic stove species, requiring abundance of heat and moisture. SYN. *Chrysodium aureum.*

A. auritum (eared).* *cau.* erect, woody. *barren fronds* with a stipe 6in. to 9in. long, deltoid, 8in. to 12in. each way, ternate, the central segments deeply pinnatifid, with lanceolate entire lobes; the lateral ones unequal sided, with lanceolate oblong-lobed lower pinnules. *fertile fronds* with a stem 12in. to 18in. long, deltoid, with distant linear pinnæ half line broad; upper

Acrostichum—*continued.*

simple, lower pinnatifid. Philippine Islands. Stove species. SYN. *Stenosemia aurita.*

A. axillare (axillary). *rhiz.* slender, wide scandent. *barren fronds* 6in. to 18in. long, about 1in. broad, simple, the point bluntish, the edge entire, the lower half tapering very gradually to the base or short stem. *fertile fronds* 6in. to 12in. long, one to three lines broad, flexuose, on a stem 1in. to 6in. long. Himalayas. Greenhouse species. SYN. *Chrysodium axillare.*

A. barbatum (bearded). Synonymous with *A. scolopendrifolium.*

A. bifurcatum (twice-forked). *sti.* densely tufted, 2in. to 4in. long, slender, stramineous, naked. *fronds* 3in. to 4in. long, about ½in. broad, pinnate; lower pinnæ of fertile fronds two or three cleft, with linear divisions; those of the barren pinnæ broader, and not so deep. St. Helena. Greenhouse species. SYN. *Polybotrya bifurcata.*

A. Blumeanum (Blume's).* *rhiz.* woody, wide climbing. *sti.* of barren fronds 6in. long, scaly. *barren fronds* 1ft. to 3ft. long, 1ft. or more broad, with numerous sessile pinnæ on each side, which are 4in. to 6in. long, 1in. broad; apex acuminate, the edge slightly toothed; base rounded. *fertile fronds* with distant pinnæ 4in. to 8in. long, ⅛in. to ¼in. broad. Assam. Greenhouse species. SYN. *Chrysodium Blumeanum.*

A. callæfolium (Calla-leaved). A form of *A. latifolium.*

A. canaliculatum (channelled).* *rhiz.* woody, wide climbing, spinulose and scaly. *sti.* 1ft. or more long, scaly throughout. *fertile fronds* 2ft. to 3ft. long, 12in. to 18in. broad, tripinnate; lower barren pinnæ, 6in. to 9in. long, 4in. to 5in. broad; pinnules lanceolate, stalked, with oblong segments, both surfaces naked; fertile pinnules close, the segments ⅛in. long, bearing three to four sessile balls of sori. Venezuela. Stove or greenhouse species. SYN. *Polybotrya canaliculata.*

A. caudatum (tailed). A synonym of *A. petiolosum.*

A. cervinum (stag-horned).* *rhiz.* woody, creeping, scaly. *sti.* 1ft. or more long, scaly. *barren fronds* 2ft. to 4ft. long, pinnate; pinnæ 4in. to 9in. long, 1in. to 2in. broad, entire or nearly so, unequal at the base; fertile pinnæ distant, linear, lanceolate, bipinnate, with short spreading sub-cylindrical pinnules. Brazil, 1840. Stove species. SYN. *Olfersia cervina.*

A. conforme (conformed). *rhiz.* wide creeping, scaly. *sti.* 1in. to 12in. long, firm, erect, stramineous, naked or slightly scaly. *fronds* 2in. to 9in. long, ¼in. to 2in. broad, acute or bluntish, the base cuneate or spathulate, the edge entire. *barren fronds* narrower than the fertile one. *A. laurifolium, A. obtusilobum,* and several others, are identical with the foregoing. Tropical America, also in the Old World. Stove species. SYN. *Elaphoglossum conforme.*

A. crinitum (hairy).* *cau.* woody, erect. *sti.* of barren fronds 4in. to 8in. long, densely clothed with long scales. *barren fronds* 9in. to 18in. long, 4in. to 9in. wide, broadly oblong; apex blunt, base rounded, edge entire and ciliated, texture subcoriaceous, both sides scattered over with scales like those of the stipes. *fertile fronds* like the others, but much smaller, the stipes longer. West Indies, &c., 1793. Stove species. SYNS. *Chrysodium* and *Hymenodium crinitum.*

A. cylindricum (cylindrical). Synonymous with *A. osmundaceum.*

A. Dombeyanum (Dombey's). A form of *A. lepidotum.*

A. flagelliferum (rod-shaped). *rhiz.* woody, creeping. *sti.* of barren fronds 6in. to 12in. long, nearly naked. *barren fronds* simple or with one to three pairs of pinnæ, the terminal one ovate lanceolate, entire or repand, often elongated and rooting at the point, the lateral ones 3in. to 6in. long, 1in. to 2in. broad; fertile pinnæ 2in. to 3in. long, about ¼in. broad. India, &c., 1828. Stove species. SYN. *Gymnopteris flagellifera.*

A. fœniculaceum (Fennel-leaved).* *rhiz.* slender, creeping. *sti.* distant, slender, 2in. to 8in. long, scaly. *barren fronds* 1in. to 2in. broad, usually dichotomously forked, with filiform divisions. *fertile fronds* ⅛in. broad, two-lobed. Andes of Ecuador. Stove species. (For culture, see *A. peltatum*). SYN. *Rhipidopteris fœniculaceum.*

A. Herminieri (Herminier's).* *rhiz.* stout, creeping. *sti.* very short, or none. *barren fronds* 1½ft. to 3ft. long, 1in. to 1½in. broad, simple, acuminate, the lower part narrowed very gradually. *fertile fronds* short-stalked, 3in. to 4in. long, 1in. to 1½in. broad. Tropical America, 1871. Stove species. SYN. *Elaphoglossum Herminieri.*

A. heteromorphum (various-formed). *rhiz.* slender, wide creeping, scaly. *sti.* 1in. to 3in. long, slender, slightly scaly. *barren fronds* 1½in. to 2in. long, ⅜in. to 1in. broad, simple, bluntish, the base rounded, both surfaces scattered over with linear dark castaneous scales. *fertile fronds* much smaller, and the stipes much longer. Columbia and Ecuador. Stove species. SYN. *Elaphoglossum heteromorphum.*

A. Langsdorffii (Langsdorff's). Synonymous with *A. muscosum.*

A. latifolium (broad-fronded).* *rhiz.* thick, woody, creeping, scaly. *sti.* 6in. to 12in. long, firm, erect, naked, or scaly. *barren fronds* 9in. to 18in. long, 2in. to 4in. broad, simple, acute, gradually narrowed below, entire; texture leathery. *fertile fronds* considerably narrower than the barren ones. *A. longifolium, A. callæfolium,* &c., are only varieties of this species. Mexico, Brazil, &c. Stove species. SYN. *Elaphoglossum latifolium.*

Acrostichum—*continued.*

A. lepidotum (scaly).* *rhiz.* thick, woody, very scaly. *sti.* 1in. to 3in. long, firm, scaly throughout. *barren fronds* 3in. to 6in. long, about ½in. broad, simple, usually blunt, the base cuneate or rather rounded, both surfaces and midrib very scaly. *A. Dombeyanum,* of garden origin, is a varietal form of this, of which there are several others. Tropical America. Stove species. SYN. *Elaphoglossum lepidotum.*

A. longifolium (long-leaved). A form of *A. latifolium.*

A. Meyerianum (Meyer's). Synonymous with *A. tenuifolium.*

A. muscosum (mossy).* *rhiz.* woody, densely scaly. *sti.* 4in. to 6in. long, firm, clothed with large pale brown scales. *barren fronds* 6in. to 12in. long, 1in. to 1½in. broad, simple, narrowed at both ends; upper surface slightly scaly; lower quite hidden by imbricated brownish scales. *barren fronds* much smaller than the others, the stipes longer. Madeira. Greenhouse species. SYN. *A. Langsdorffii.*

A. Neitnerii. Synonymous with *A. quercifolium.*

A. nicotianæfolium (Tobacco-leaved).* *rhiz.* woody, wide creeping, scaly. *sti.* 1½ft. to 2ft., scaly below. *barren fronds* 1ft. to 3ft. long, 1ft. or more broad, with a large terminal pinna, and one to three lateral pairs, which are 6in. to 9in. long, 1in. to 3in. broad, acuminate, entire, or nearly so, the base slightly rounded, fertile pinnæ distant, 3in. to 4in. long, ⅜in. broad. Cuba, &c. Stove species. SYN. *Gymnopteris nicotianæfolium.*

A. osmundaceum (Osmunda-like).* *rhiz.* woody, wide scandent, scaly. *sti.* 12in. to 18in. long, firm, erect, scaly at the base. *barren fronds* ample, bi- or tripinnate; the lower pinnæ 1ft. to 2ft. long, 4in. to 8in. broad; pinnules stalked, lanceolate, with closely set sub-entire segments, of a light green colour; both surfaces naked. *fertile fronds* nearly or quite as large as the barren ones; segments linear cylindrical, ⅛in. to ¼in. long. Tropical America. Stove species. SYNS. *A. cylindricum,* and *Polybotrya osmundaceum.*

A. paleaceum (chaffy). Synonymous with *A. squamosum.*

FIG. 22. ACROSTICHUM PELTATUM.

A. peltatum (peltate-fronded).* *rhiz.* slender, wide creeping. *sti.* distant, slender, 1in. to 4in. long, scaly throughout. *barren fronds* 1in. to 2in. each way, repeatedly dichotomously forked, with narrow linear ultimate divisions, quarter to half line broad. *fertile fronds* ½in. broad, often two-lobed. West Indies. Stove or greenhouse species. This elegant little fern requires a liberal supply of water all the year round, and is best grown in a well drained pan of good fibrous peat, leaf soil, and sand, with some nodules of sandstone raised above the rim of the pan; do not disturb it more than is necessary. SYN. *Rhipidopteris peltata.* See Fig. 22.

A. petiolosum (petioled). *rhiz.* woody, wide scandent. *sti.* woody, erect, scaly at the base. *fronds* bipinnate, or tripinnatifid, 2ft. to 4ft. long, 1ft. to 3ft. broad, deltoid; the upper barren pinnæ

Acrostichum—*continued*

lanceolate, pinnatifid, the longest sometimes 18in. long, and 6in. to 10in. broad; pinnules with long falcate lobes reaching half-way down to the midrib, both surfaces naked; fertile pinnules very narrow, and dangling, continuous or beaded. West Indies, Mexico, &c. Stove species. SYNS. *Polybotrya* and *A. caudatum.*

A. piloselloides (mouse ear-leaved). Synonymous with *A. spathulatum.*

A. platyrhynchos (broad-beaked). *sti.* tufted, scarcely any. *fronds* 12in. to 16in. long, 1in. broad, simple. *sori* in a patch at the apex, 1in. to 2in. long, ⅜in. broad, which does not reach to the entire edge; the lower part narrowed gradually, with naked surfaces, and a coriaceous texture. Philippines. Stove species. SYN. *Hymenolepis platyrhynchos.*

A. quercifolium (Oak-leaved).* *rhiz.* stout, wide creeping. *sti.* of barren fronds 1in. to 2in. long, clothed with brownish hairs. *barren fronds* 3in. to 4in. long, 1½in. to 2in. broad, the terminal pinnæ with blunt rounded lobes. *fertile fronds* with a terminal pinna, 1in. to 2in. long, one line broad, and a pair of smaller lateral ones, with slender stipes 6in. to 9in. long, hairy at the base. Ceylon. Stove species. SYNS. *A. Neitnerii* (of gardens), *Gymnopteris quercifolia.*

A. scandens (climbing).* *rhiz.* woody, wide climbing. *sti.* 3in. to 4in. long, firm, erect, naked. *fronds* 1ft. to 3ft. long, 1ft. or more broad, simply pinnate; barren pinnæ, 4in. to 8in. long, ⅜in. to 1¼in. broad, acuminate, the edge thickened and serrulate, the base cuneate, sessile, or slightly stalked, articulated; fertile pinnæ, 6in. to 12in. long, one and a half to two lines broad, the lower ones distant. Himalayas, &c., 1841. Stove or greenhouse species. SYN. *Stenochlæna scandens.*

A. scolopendrifolium (Scolopendrium-fronded).* *rhiz.* woody, creeping, scaly. *sti.* 4in. to 12in. long, firm, erect, densely clothed with blackish scales. *barren fronds* often 1ft. long, 1¼in. to 3in. broad, simple, acute, the base narrowed gradually; edge and mid-rib scaly. *fertile fronds* much smaller than the barren ones. Guatemala, &c. Stove species. SYN. *A. barbatum.*

A. serratifolium (serrate-fronded). *rhiz.* woody, short creeping. *sti.* of barren fronds 12in. to 18in. long, slightly scaly. *barren fronds* 2ft. long, 6in. to 12in. broad, with numerous sessile pinnæ on each side, 3in. to 6in. long, ⅜in. to 1½in. broad, inciso-crenate, the base cuneate; fertile pinnæ distant, 2in. to 3in. long, ½in. to ⅝in. broad, blunt, entire. Venezuela, &c. Stove species. SYN. *Chrysodium serratifolium.*

A. simplex (simple-fronded). *rhiz.* woody, creeping, scaly. *sti.* 1in. to 4in. long, firm, erect, naked. *barren fronds* 4in. to 12in. long, about 1½in. broad, very acute, the lower part narrowed very gradually. *fertile fronds* narrower than the barren ones, with longer stipes. Cuba to Brazil, 1798. Stove species. SYN. *Elaphoglossum simplex.*

A. sorbifolium (Service-leaved).* *rhiz.* thick, woody, often 30ft. to 40ft. long, clasping trees like a cable, sometimes prickly. *fronds* 12in. to 18in. long, 6in. to 12in. broad, simply pinnate; barren pinnæ 4in. to 6in. long, about ½in. broad, three to twenty on each side, articulated at the base, entire or toothed; fertile pinnæ 1in. to 2in. apart, 2in. to 4in. long, about ½in. broad. West Indies, 1793. There are several varieties of this species, chiefly differing in the number of pinnæ. Stove species. SYN. *Stenochlæna sorbifolia.*

A. s. cuspidatum (cuspidate).* This is only a variety of the above species with long-stalked, ligulate-cuspidate pinnæ; but it is usually regarded as a distinct species in gardens.

A. spathulatum (spoon-shaped). *sti.* tufted, 1in. to 2in. long, firm, erect, scaly. *barren fronds* ½in. to 4in. long, ½in. to ½in. broad, obovate-spathulate, blunt, tapering narrowly or gradually at the base, with a coriaceous texture; both surfaces and the margins copiously scaly. *fertile fronds* smaller than the barren, with longer stipes. Tropical America, South Africa, &c. Stove species. SYN. *A. piloselloides.*

A. spicatum (spiked). *rhiz.* woody, short creeping. *sti.* 1in. to 2in. long, firm. *fronds* 6in. to 18in. long, ½in. to 1in. broad, the upper part contracted and fertile, entire, the lower part narrowed very gradually. Himalayas, &c. Greenhouse species. SYN. *Hymenolepis brachystachys.*

A. squamosum (scaly).* *rhiz.* woody, densely scaly. *sti.* 2in. to 4in. long, densely clothed with pale or dark-coloured scales. *barren fronds* 6in. to 12in. long, about 1in. broad, simple, acute, the base narrowed gradually; both sides matted, and the edge densely ciliated with reddish scales. *fertile fronds* as long as the barren ones, but much narrower, the stipes much longer. Widely distributed in both hemispheres. Stove or greenhouse species. SYN. *A. paleaceum.*

A. subdiaphanum (semi-transparent).* *cau.* woody, erect. *sti.* tufted, 2in. to 6in. long, firm, erect, scaly. *barren fronds* 4in. to 8in. long, 1in. to 1½in. broad, simple, both ends narrowed, the edge entire. *fertile fronds* much narrower, on longer stipes. St. Helena. Greenhouse species. SYN. *Aconiopteris subdiaphana.*

A. subrepandum (slighty-waved).* *rhiz.* woody, wide-creeping. *sti.* of barren fronds stout, erect, nearly naked. *barren fronds* from 1ft. to 2ft. long, 2in. to 12in. broad, copiously pinnate, with linear-oblong entire or subrepand pinnæ on each side, which are sometimes 6in. to 8in. long, and 2in. broad. *fertile fronds* like the others, but smaller. Isle of Luzon, &c. Stove species. SYN. *Gymnopteris subrepanda.*

Acrostichum—*continued.*

A. taccæfolium (Tacca-leaved).* *cau.* woody, densely scaly. *sti.* of barren fronds 1in. to 4in. long, scaly. *barren fronds* from 1ft. to 2ft. long, 3in. to 12in. broad, simple, oblong-lanceolate, entire, copiously pinnate, with oblong-lanceolate pinnæ, 1in. to 6in. long, ½in. to 1½in. broad, the upper ones narrowly decurrent, the lower ones forked at the base on the under side. *fertile fronds* simple, 6in. to 12in. long, ½in. broad, or pinnate, with forked linear pinnæ. The three-lobed form of this species is sometimes known as *A. trilobum.* Philippines. Stove species. SYN. *Gymnopteris taccæfolia.*

A. tenuifolium (narrow-fronded).* *rhiz.* wide scandent, woody, slightly scaly. *barren fronds* simply pinnate, the stipes 4in. to 6in. long, naked, firm, erect, the fronds 3ft. to 5ft. long, 12in. to 18in. broad; pinnæ 6in to 9in. long, ⅜in. to 1½in. broad, acuminate, the edge thickened and serrulate, short-stalked. *fertile fronds* bi-pinnate, with longer stipes; pinnæ long-stalked, with numerous distant pinnules. South Africa. Stove or greenhouse species. SYNS. *A. Meyerianum* and *Stenochlæna tenuifolia.*

A. trilobum (three-lobed). A form of *A. taccæfolium.*

A. villosum (hairy).* *rhiz.* woody, densely scaly. *sti.* 2in. to 4in. long, slender, densely clothed with scales. *barren fronds* 6in. to 9in. long, 1in. to 1½in. broad, acute, the lower part narrowed gradually; both surfaces scaly, and the edge more or less ciliated. *fertile fronds* much smaller than the others. Mexico, &c. Stove species.

A. viscosum (clammy).* *rhiz.* woody, creeping, densely scaly. *sti.* 3in. to 6in. long, firm, erect, scaly, often viscous. *barren fronds* 6in. to 12in. long, ½in. to 1in. broad, simple, acute, the lower part narrowed gradually; both surfaces more or less viscid, and minutely scaly. *fertile fronds* smaller, with longer stipes. Tropical America and the tropics of the Old World, 1826. Very variable in form. Stove species.

ACROTRICHE (from *akros*, top, *i.e.*, outermost—and *thrix*, a hair; the tips of the petals are bearded). ORD. *Epacrideæ.* A genus of eight or nine species of dwarf, much branched, ornamental greenhouse evergreen shrubs. Flowers white or red; spikes axillary, short; corolla funnel-shaped; petals with deflexed hairs at apex. Cultivated in an equal mixture of sandy loam and peat, and propagated by cuttings made of the young shoots, pricked in sand, covered with a bell glass, and placed in a cool house; afterwards treated like *Epacris.*

A. cordata (heart-leaved).* *fl.* white, small, axillary, twin, or solitary. April. *l.* cordate, flat, striated below. *h.* 1ft. New Holland, 1823.

A. divaricata (straggling).* *fl.* white, small, in axillary spikes. May. *l.* lanceolate, mucronate, divaricate, flat, both surfaces green. *h.* 6in. to 1ft. New South Wales, 1824.

A. ovalifolia (oval-leaved). *fl.* white, small, in axillary spikes. March. *l.* ovate and oval, obtuse, flat, with smooth margins. *h.* 6in. to 1ft. New Holland, 1824.

ACTÆA (from *aktaia*, an Elder; in allusion to the resemblance of the foliage to that of the Elder). Baneberry. ORD. *Ranunculaceæ.* A small genus of perennial herbaceous plants, with bi- or triternate leaves, and long, erect racemes of whitish flowers, which are succeeded by poisonous berries. They are excellent subjects for shady places, beneath trees, or in the wild garden. Easily increased by division of the roots, and seed during spring.

A. alba (white).* *fl.* white; racemes simple. May, June. *l.* ovate-lanceolate, serrate or cut. Berries white, ovate-oblong, *h.* 1ft. to 1½ft. N. America.

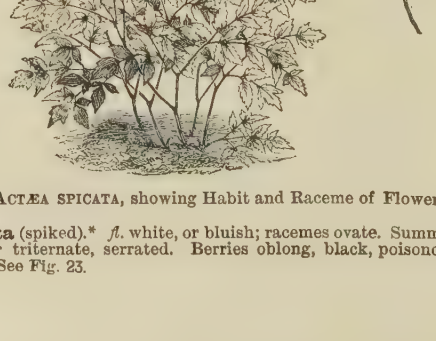


FIG. 23. ACTÆA SPICATA, showing Habit and Raceme of Flowers.

A. spicata (spiked).* *fl.* white, or bluish; racemes ovate. Summer. *l.* bi- or triternate, serrated. Berries oblong, black, poisonous. *h.* 1ft. See Fig. 23.

Actæa—*continued.*

A. s. rubra (red).* This differs from the type in having bright red berries, which are disposed in dense clusters on spikes overtopping the foliage. North America. A very handsome hardy perennial.

ACTINELLA (from *aktin*, a ray; small rayed). SYN. *Picradenia.* ORD. *Compositæ.* A small genus of hardy herbaceous plants, having radiate capitules. The only species worth cultivating is *A. grandiflora.* It thrives in an open border with a light soil. Increased by divisions of the root in spring.

A. grandiflora (large-flowered).* *fl.-heads* yellow, large, and handsome, 3in. in diameter. Summer. *h.* 6in. to 9in. Colorado. A very pretty branched perennial, suitable for the alpine garden.

A. lanata (woolly). *See* **Eriophyllum cæspitosum.**

ACTINIDIA (from *aktin*, a ray; the styles radiate like the spokes of a wheel). SYN. *Trochostigma.* ORD. *Ternstræmiaceæ.* A genus of ornamental hardy deciduous climbing shrubs, with axillary corymbs of flowers; sepals and petals imbricate. Leaves entire. The species are well suited for trellis-work or walls, and thrive in a light rich soil. Increased by seeds, layers, or cuttings; the latter should be inserted under a hand light in autumn, in sandy soil.

Actiniopteris—*continued.*

moist atmosphere is also essential, and the plants may be syringed two or three times a day. A mean summer temperature of 78deg. to 80deg., with a night one of not less than 65deg., is desirable. In winter, a mean temperature of about 73deg., and a night one of not less than 60deg., should be maintained.

A. radiata (rayed).* *sti.* densely tufted, 2in. to 6in. long. *fronds* fan shaped, 1in. to 1½in. each way, composed of numerous dichotomous segments, half line broad, those of the fertile frond longer than those of the barren one. India, &c. (very widely distributed), 1869. In form this elegant little species is a perfect miniature of the Fan Palm, *Latania borbonica.*

A. r. australis (southern).* *fronds*, segments fewer, larger, and subulate at the point. Plant much larger and more vigorous.

ACTINOCARPUS (from *aktin*, a ray, and *karpos*, fruit; referring to the curiously radiated fruit, resembling a star fish). ORD. *Alismaceæ.* Pretty little aquatic perennials, with habit and inflorescence of *Alisma.* Carpels six to eight, connate at base, spreading horizontally. Excellent for naturalising in bogs and pools. Increased by seeds and divisions during spring.

A. Damasonium (Damasonium). Ray Pod. *fl.* white, very

FIG. 24. ACTINIDIA VOLUBILIS.

A. Kolomikta (Kolomikta).* *fl.* white, solitary, axillary, or cymose, ½in. in diameter; peduncles about ½in. long. Summer. *l.* ovate-oblong, petiolate, rounded or sub-cordate at the base, and tapering into a long point, serrate; the autumnal tints are very handsome, changing to white and red. N. E. Asia, 1880. Rarely met with.

A. polygama (polygamous). *fl.* white, fragrant. Summer. *l.* cordate, serrate, petiolate. Japan, 1870. The berries of this species are edible.

A. volubilis (twining).* *fl.* white, small. June. *l.* oval on flowering branches, elliptic on climbing stems. Japan, 1874. A very free growing species. See Fig. 24.

ACTINIOPTERIS (from *aktin*, a ray, and *pteris*, a fern; the fronds are radiately cut into narrow segments). ORD. *Filices.* Sori linear-elongated, sub-marginal; involucres (= indusia) the same shape as the sorus, folded over it, placed one on each side of the narrow segments of the frond, opening towards the midrib. A small genus of beautiful and distinct stove ferns. They thrive in a compost of equal parts crocks and charcoal, about the size of peas, which must be mixed with silver sand and a very small portion of loam and peat. About half the pot should be filled with crocks, perfect drainage being necessary. A delicate; each petal has a yellow spot at the base; scapes with a terminal umbel. June. *l.* radical, on long petioles, sometimes floating, elliptical, five-nerved. A native aquatic. The proper name of this plant is *Damasonium stellatum.*

A. minor (smaller).* This greenhouse species, also with white flowers, from New South Wales, is smaller.

ACTINOMERIS (from *aktin*, a ray, and *meris*, a part; referring to the radiated aspect of the plants). SYN. *Pterophyton.* ORD. *Compositæ.* A small genus of herbaceous perennials allied to *Helianthus*, but with compressed and winged achenes. Flower-heads corymbose, Coreopsis-like. Leaves ovate or lanceolate, serrate. They are hardy, ornamental plants, and of easy cultivation, in a loamy soil. Increased in spring, by seeds and division of the roots, on a warm border, with or without hand lights, or in cold frames. With the exception of *A. helianthoides*, they are but little known in this country.

A. alata (wing-stalked). *fl.-heads* yellow. July. *h.* 3ft. America. 1803.

A. helianthoides (Sunflower-like).* *fl.-heads* yellow, 2in. across, July to September. *h.* 3ft. S. America, 1825.

A. procera (tall).* *fl.-heads* yellow. September. *h.* 8ft. N. America, 1766.

Actinomeris—*continued.*

A. squarrosa (rough-headed).* *fl.-heads* yellow, in loose terminal panicles. July and August. *l.* decurrent, broadly lanceolate, coarsely toothed. Stem square, winged. *h.* 3ft. North America, 1640. SYN. *Verbesina Coreopsis.*

ACTINOPHYLLUM. *See* **Sciadophyllum.**

ACTINOSTACHYS. Included under **Schizæa** (which *see*).

ACTINOTUS (from *actinotos*, furnished with rays; referring to the involucre). ORD. *Umbelliferæ.* An Australian genus of greenhouse herbaceous perennials. Flowers shortly pedicellate, numerously disposed in simple umbels; petals none. Leaves alternate, petiolate. They thrive best in loam and peat, and are increased by root division and seeds. The latter should be sown on a hotbed, in spring, and in May the seedlings may be transplanted out in the open border in a warm situation, where they will flower and seed freely.

A. helianthus (sunflower).* *fl.* white, in many-flowered capitate umbels; involucre many leaved, radiating, longer than the flowers. June. *l.* alternate, bipinnatifid; lobules bluntish. *h.* 2ft. 1821. SYN. *Eriocalia major.*

A. leucocephalus (white-headed). *fl.* white. June. *h.* 2ft. 1837.

FIG. 25. ADA AURANTIACA.

ACULEATUS. Armed with prickles.

ACULEOLATUS. Armed with small prickles.

ACULEUS. A prickle; a conical elevation of the skin of a plant, becoming hard and sharp-pointed.

ACUMEN. An acute terminal angle.

ACUMINATE. Extended into an acute terminal angle; this word is confined to considerable extension.

ACUNNA OBLONGA. *See* **Bejaria æstuans.**

ACUTE. Sharp-pointed.

ACYNTHA. A synonym of **Sanseviera** (which *see*).

ADA (a complimentary name). ORD. *Orchideæ.* An evergreen orchid, very closely allied to *Brassia*, from which it differs chiefly in having the lip parallel with, and solidly united to, the base of the column. Some authorities now refer the plant to the genus *Mesospinidium.* It requires to be potted in peat and sphagnum, in equal parts. The drainage must be perfect, and, during summer, the water supply profuse. Although in winter far less will suffice, the plant should not be allowed to become dry. Propagated by divisions as soon as the plant commences growth.

A. aurantiaca (orange).* *fl.* orange-scarlet, in long terminal nodding racemes, each bearing from six to ten blossoms; petals elongated, streaked with black inside. Winter and spring. *l.* two or three to each plant, linear, dark green, about 6in. in length. Habit erect, with somewhat cylindrical pseudo-bulbs, which taper upwards. See Fig. 25.

ADAMIA (named after John Adam, some time Governor-General of India, and a promoter of natural history). ORD. *Saxifrageæ.* A small genus of Hydrangea-like greenhouse evergreen shrubs, having many flowered terminal corymbs of flowers, and opposite, petiolate, oblong-lanceolate, serrated leaves. They thrive well in a mixture of loam, peat, and sand; and cuttings will root readily in a similar compost, under a hand glass.

A. cyanea (blue-berried). *fl.* whitish, or pink. June. *h.* 6ft. Nepaul, in rocky places, 1829.

A. sylvatica (wood). *fl.* blue; cymes nearly undivided, on short peduncles, disposed in a close panicle. June. *h.* 6ft. Java, 1846.

A. versicolor (many-coloured). *fl.* blue. August. China, 1844.

ADAM'S APPLE. *See* **Citrus Limetta, Musa paradisiaca,** and **Tabernæmontana coronaria.**

ADAMSIA. *See* **Geum** and **Puschkinia.**

ADAM'S NEEDLE. *See* **Yucca.**

ADANSONIA (named after Michael Adanson, an eminent French botanist). ORD. *Sterculiaceæ.* This is reputed to be one of the largest trees in the world, as far as the girth of the trunk is concerned; but it is seldom seen in cultivation in this country.

A. digitata (finger-leaved). Baobab-tree; Sour Gourd. *fl.* white, about 6in. across, with purplish anthers, on long, axillary, solitary pedicels. *l.* palmate, with three leaflets in the young plants, and five to seven in adult ones. *h.* 40ft. Africa.

ADDER'S FERN. *See* **Polypodium vulgare.**

ADDER-SPIT. *See* **Pteris aquilina.**

ADDER'S TONGUE. *See* **Ophioglossum.**

ADELOBOTRYS (from *adelos*, obscure, and *botrys*, a cluster). ORD. *Melastomaceæ.* Stove climbing shrubs with terete branches. Flowers white, crowded in cymose heads at the tops of the branches. Leaves clothed with rufous hairs on both surfaces when young, but in the adult state glabrous, except the nerves, petiolate, ovate, cordate, acuminated, ciliately serrated, five-nerved. For general culture, *see* **Pleroma.**

A. Lindeni (Linden's).* *fl.* white, changing to purple. Brazil, 1866.

A. scandens (climbing).* This, the original species, possibly not now in cultivation, is a native of French Guiana.

ADENANDRA (from *aden*, a gland, and *aner*, a male; the anthers terminate in a globose gland). ORD. *Rutaceæ.* Very beautiful little greenhouse shrubs from the Cape of Good Hope. Flowers large, usually solitary at the tops of the branches; stamens ten, the five opposite the petals sterile, five fertile ones similar in form, but shorter. Leaves usually alternate, flat, glandularly dotted. They thrive in a mixture of sand and peat, with a little turfy loam. The young tops, before they begin to throw out their buds, made into cuttings, and planted in a pot of sand, with a bell glass placed over them, will root without bottom heat.

A. acuminata (acuminate). Synonymous with *A. amœna.*

A. amœna (pleasing).* *fl.* large, whitish above, and reddish beneath, solitary, sessile, terminal. June. *l.* scattered, oblong or oval, bluntish, smooth, dotted beneath. *h.* 1ft. to 2ft. 1798. SYN. *A. acuminata.*

Adenandra—*continued.*

A. coriacea (leathery-leaved). *fl.* large, pink, usually solitary on the tops of the branches. June. *l.* scattered, oblong, obtuse, revolute, quite smooth. *h.* 1ft. to 2ft. 1720.

A. fragrans (fragrant).* *fl.* rose colour, on long peduncles, fragrant; pedicels clammy, aggregate, umbellate. May. *l.* scattered, smooth, spreading very much, ovate-oblong, glandular, a little crenulated. *h.* 1ft. to 2ft. 1812.

A. linearis (linear-leaved). *fl.* white, terminal, on long, usually solitary, pedicels. June. *l.* opposite, linear, obtuse, spreading; branches and pedicels smooth. *h.* 1ft. 1800.

A. marginata (margined).* *fl.* pale flesh-colour, on long peduncles; umbels terminal. June. *l.* scattered, smooth, transparent, cordate, lower ones ovate, upper ones lanceolate. *h.* 1ft. to 2ft. 1806.

A. umbellata (umbel-flowered).* *fl.* pink, almost sessile, terminal, umbellate, petals fringed. June. *l.* oblong or obovate, dotted beneath, fringed on the edges. *h.* 1ft. to 2ft. 1790.

A. u. speciosa (showy).* *fl.* large, pink, nearly sessile, terminal, umbellate. June. *l.* scattered, oblong or obovate, revolute, dotted beneath, smooth, but a little fringed on the edges. *h.* 1ft. to 2ft. 1790.

A. uniflora (one-flowered).* *fl.* large, whitish inside, and pinkish outside, nearly sessile, solitary, terminal. June. *l.* scattered, oblong-lanceolate, somewhat pointed, revolute, smooth, dotted beneath. *h.* 1ft. to 2ft. 1775.

A. villosa (shaggy).* *fl.* pink, nearly sessile, terminal, umbellate; sepals, petals, and stamens fringed. June. *l.* crowded, ovate-oblong, fringed, pubescent and glandular beneath. *h.* 1ft. to 2ft. 1786.

ADENANTHERA (from *aden*, a gland, and *anthera*, an anther; in reference to the anthers, which are each terminated by a deciduous, pedicellate gland). ORD. *Leguminosæ*. A small genus of stove evergreen trees, with racemose spikes of small flowers and bipinnate or decompound leaves. They thrive well in a mixture of peat and loam. Increased by cuttings, which should be taken off at a joint and planted in heat in a pot of sand, placing a bell glass over them.

A. chrysostachys (golden-spiked). *fl.* golden. *h.* 15ft. Mauritius, 1824.

A. falcata (sickle-shaped). *fl.* yellowish. *h.* 6ft. India, 1812.

A. pavonina (peacock-like).* Peacock Flower Fence. *fl.* white and yellow mixed. May. *l.*, leaflets oval, obtuse, glabrous on both surfaces. *h.* 5ft. India, 1759.

ADENANTHOS (from *aden*, a gland, and *anthos*, a flower; referring to the glands on the flowers). ORD. *Proteaceæ*. Ornamental greenhouse evergreen pilose shrubs, thriving in sandy peat. Propagated in spring by cuttings, which should be placed in sandy soil under a bell glass, with a gentle bottom heat.

A. barbigera (bearded).* *fl.* red, axillary, solitary, pedunculate; perianth pilose, bearded at top; involucre spreading, villous. June. *l.* oblong-lanceolate, obtuse, triple-nerved. *h.* 7ft. Swan River, 1845.

A. cuneata (wedge-leaved). *fl.* red. July. *h.* 5ft. New Holland, 1824.

A. obovata (obovate-leaved).* *fl.* red. July. *h.* 5ft. New Holland, 1826.

ADENIUM (from Aden, where it is found). ORD. *Apocynaceæ*. Greenhouse evergreen succulent shrubs. The species mentioned below is remarkable in having a globose thick caudex or stem; branches dichotomous; corolla salver-shaped. They require a well-drained compost of sand and loam. Half-ripened cuttings strike root readily in sand, under a hand glass. But little water is required when the plants are not in a growing state.

A. obesum (fat). *fl.* pinky-crimson, downy; corymbs terminal, many-flowered; pedicels short. June. *l.* close together at the tops of the branches, 3in. long, oblong, narrowed at the base, abruptly terminated by a hard, short point. *h.* 3ft. or 4ft. Aden, 1845.

ADENOCALYMNA (from *aden*, a gland, and *calymna*, a covering; referring to the conspicuous glands on the leaves and floral coverings). ORD. *Bignoniaceæ*. An elegant genus of stove evergreen climbers. Flowers racemose, trumpet-shaped, bracteate. Leaves ternate or binate. Stems slender. They require a hot and moist temperature to grow them successfully, and thrive best in a compost of loam and peat. Cuttings will root in sand, if placed under a bell glass, with bottom heat.

Adenocalymna—*continued.*

A. comosum (hairy).* *fl.* yellow; racemes spicate, axillary, and terminal; bracts comose. September. *l.* trifoliate and conjugate, tendrilled; leaflets ovate, leathery, glandular. *h.* 10ft. Brazil, 1841.

A. longeracemosum (long-racemed). *fl.* yellow. October. Brazil.

A. nitidum (shining).* *fl.* yellow; racemes axillary, nearly terminal, velvety; corolla velvety; bracts narrow, glandular. February. *l.* trifoliate or conjugate, tendrilled; leaflets elliptic, oblong. *h.* 10ft. Brazil, 1848.

ADENOCARPUS (from *aden*, a gland, and *karpos*, a fruit; in reference to the legumes being beset with pedicellate glands). ORD. *Leguminosæ*. Shrubs, with numerous racemes of yellow flowers; divaricate branches, trifoliate usually aggregate leaves, having petiolar stipulas, and complicated leaflets. All the species are elegant when in flower, and well suited for ornamenting the fronts of shrubberies. Except where otherwise mentioned, all are hardy. They thrive best in a mixture of loam, peat, and sand; and may be readily increased by seeds or layers, or by grafting the rarer on the commoner kinds. Young cuttings will root freely in sand, covered by a hand glass, which should be taken off and wiped occasionally. Seeds may be sown in March, the hardy species out of doors, and the others in a cold house.

A. foliolosus (slightly-leaved).* *fl.* yellow; racemes terminal; calyx covered with glandless hairs, with the lower lip elongated and trifid at the apex; the segments equal. May. *l.* (and branches) much crowded, hairy, trifoliate. *h.* 4ft. to 6ft. Canary Islands, 1629. A half-hardy evergreen species.

A. frankenioides (Frankenia-like).* *fl.* yellow, crowded; racemes terminal; calyx beset with glandular pubescence, with the lower lip having the middle segment longer than the lateral ones, and exceeding the lower lip. April. *l.* trifoliolate, much crowded, hairy; branches velvety. *h.* 1ft. to 3ft. Teneriffe, 1815. Evergreen. Requires protection in winter.

A. hispanicus (Spanish).* *fl.* yellow, crowded; racemes terminal; calyx beset with glands and hairs; lower lip of calyx with three equal segments, hardly longer than the upper lip. June. *l.* trifoliolate, grouped. Branchlets hairy. *h.* 2it to 4ft. Spain, 1816. Deciduous.

A. intermedius (intermediate).* *fl.* yellow, not crowded; racemes terminal; calyx beset with glandular pubescence, with the lower lip trifid, the lateral segments shorter than the middle ones, and much exceeding the upper lip. May. *l.* trifoliate, grouped; branches rather shaggy. *h.* 3ft. to 4ft. Sicily and Naples, on mountains, 1816. Deciduous.

A. parvifolius (small-leaved).* *fl.* yellow, not crowded; racemes terminal; calyx clothed with glandular pubescence, with the middle segment of the lower lip longer than the lateral ones, much exceeding the upper lip. May. *l.* trifoliate, grouped, small; branches glabrous. *h.* 3ft. to 4ft. France, on exposed heaths, 1800. Deciduous.

A. telonensis (Toulon).* *fl.* yellow, not crowded; racemes terminal; calyx clothed with glandless pubescence, the segments of the lower lip about equal in length, a little longer than the upper lip. June. *l.* trifoliate, grouped; branchlets smoothish. *h.* 2ft. to 4ft. South France, 1800. Deciduous.

ADENOPHORA (from *aden*, a gland, and *phoreo*, to bear; in reference to the cylindrical nectary which girds the base of the style). ORD. *Campanulaceæ*. A genus of elegant hardy border perennials, very similar in habit, shape of flower, &c., to *Campanula*, from which genus *Adenophora* differs in having the style surrounded by a cylindrical gland. Flowers stalked, drooping, spicate. Leaves broad, stalked, somewhat whorled. They grow best in light rich garden soil, with a warm sunny position, and should be increased by seeds, as dividing the roots is the sure way to lose them. They are easily raised from seeds, which may be sown as soon as ripe, or in spring, in pots placed in a cold frame.

A. coronopifolia (buckhorn-leaved).* *fl.* blue, large, three to ten, racemose, at the top of the stem, on short pedicels. July. *l.* radical ones petiolate, ovate-roundish, cordate, crenately toothed; upper ones sessile, linear-lanceolate, nearly entire, quite glabrous. *h.* 1ft. to 2ft. Dahuria, 1822.

A. denticulata (toothed-leaved).* *fl.* blue, small, numerous, on short pedicels, disposed in a more or less loose elongated raceme. July. *l.* serrated, smoothish; radical ones petiolate, rounded; upper ones sessile, ovate-lanceolate. *h.* 1½ft. Dahuria, 1817. SYN. *A. tricuspidata*.

A. Fischeri (Fischer's).* *fl.* blue, or whitish blue, numerous, sweet-scented, disposed in a more or less compound, elongated, and loose pyramidal panicle. August. *l.* radical ones petiolate, ovate-roundish, cordate, crenately toothed; upper ones sessile,

Adenophora—*continued.*

ovate-lanceolate, coarsely serrated. *h.* 1½ft. Siberia, 1784. SYN. *A. liliiflora.*

A. Gmelini (Gmelin's). *fl.* blue, secund, three to ten, on the top of each stem, rising from the axils of the upper leaves, disposed in a long raceme. July. *l.* upper ones erect, linear, very narrow, entire, glabrous. *h.* 1ft. to 2ft. Dahuria, in dry stony places, 1820.

A. intermedia (intermediate). *fl.* pale blue, small, racemose. May. *l.* radical ones petiolate, cordate, toothed; upper ones lanceolate, tapering to a point at the base, serrated, crowded. *h.* 3ft. Siberia, 1820.

A. Lamarckii (Lamarck's).* *fl.* blue; corolla funnel-shaped, disposed in an elongated, many-flowered, raceme, which is compound at the base. June. *l.* ovate-lanceolate, acutely serrated, ciliated, glabrous, except on the margins. *h.* 1ft. to 2ft. Eastern Europe, 1824.

A. latifolia (broad-leaved). Synonymous with *A. pereskiæfolia.*

A. liliiflora (Lily-flowered).* *fl.* numerous, sweet-scented, in a loose pyramidal panicle. Central and Eastern Europe.

A. pereskiæfolia (Pereskia-leaved).* *fl.* blue, rather numerous, scattered over the upper part of the stems, rarely subverticillate; peduncles one to two, or three-flowered. July. *l.* three to five in a whorl, ovate-oblong, acuminated, coarsely serrated, roughly ciliated. *h.* 1½ft. Dahuria, 1821. SYN. *A. latifolia.*

A. periplocæfolia (Periploca-leaved). *fl.* pale blue, at the top of the stem, sometimes only one. June. *l.* petiolate, ovate, acute, somewhat cordate, crenately serrated. Stem ascending. *h.* 3in. Siberia, 1824. Rockery species.

A. stylosa (long-styled).* *fl.* pale blue, small, few, disposed in a loose, naked, raceme. May. *l.* petiolate; lower ones obovate, sinuate; upper ones ovate, acuminated, glabrous. Stem ascending. *h.* 1ft. to 1½ft. Eastern Europe, 1820.

A. tricuspidata (three-cusped). Synonymous with *A. denticulata.*

A. verticillata (whorled).* *fl.* pale blue, small, irregularly disposed at the tops of the stems; lower whorls many-flowered, distant; peduncles one to three-flowered. June. *l.* in whorls, serrately toothed; radical ones petiolate, roundish; upper ones ovate-lanceolate. Stems simple. *h.* 2ft to 3ft. Dahuria, 1783.

ADENOSTOMA (from *aden*, a gland, and *stoma*, a mouth). ORD. *Rosaceæ.* Hardy shrubs, having small, racemose, five-petaled flowers. They grow freely in rich loam and peat in equal proportions. Propagated in spring or autumn, by cuttings made of the young shoots, inserted in sand, under glass.

A. fasciculata (fascicled).* *fl.* white, small, produced in terminal panicles. *h.* 2ft. California, 1848. A Heath-like evergreen bushy plant, allied to *Alchemilla.*

ADESMIA (from *a*, without, *desmos*, a bond; in reference to the stamens being free). ORD. *Leguminosæ.* Chiefly greenhouse evergreen shrubs, or trailers, from South America, with lanceolate stipulas, abruptly pinnate leaves, ending in a bristle; axillary one-flowered pedicels, or the flowers racemosely disposed at the tops of the branches, in consequence of the upper leaves being abortive. They will grow well in a mixture of loam, peat, and sand. Propagated by cuttings placed in sand, covered by a hand glass, in a gentle heat; or by seeds, which are generally more satisfactory. The annual species—*A. muricata, A. pappposa*, and *A. pendula*—are not worth growing. The following are fairly representative of the most ornamental species.

A. glutinosa (sticky).* *fl.* yellow; racemes elongated, terminal, simple, spinescent, and are (as well as the linear bracteas) clothed with white hairs. May. *l.* with about three pairs of elliptic, hairy leaflets; branches spreading, beset with glandular, glutinous hairs. Stem shrubby; legumes three-jointed, very long. *h.* 1ft. to 2ft. 1831.

A. Loudonii (Loudon's). *fl.* yellow. May, *h.* 2ft. Valparaiso, 1830.

A. microphylla (small-leaved).* *fl.* yellow; racemes somewhat capitate, terminal, simple, spinescent. June. *l.* with six pairs of small orbicular leaflets, on short petioles, pubescent; branches spinose. Stem shrubby. *h.* 1ft. to 2ft. 1830.

A. Uspallatensis (Uspallatan). *fl.* yellow. July. *h.* 1ft. China, 1832.

A. viscosa (clammy). *fl.* yellow. August. *h.* 12ft. Chili, 1831.

ADHATODA (its native name). ORD. *Acanthaceæ.* Allied to *Justicia.* Very ornamental stove shrubs, requiring a good fibrous peat and loam, with a moderate addition of silver sand. To grow them well, they require liberal treatment and plenty of heat, when the flowers will be produced

Adhatoda—*continued.*

in great profusion. Increased by young cuttings in spring, placed in sandy soil, in bottom heat. *See* **Justicia.**

A. cydoniæfolia (Quince-leaved).* *fl.* produced in rather dense clusters at the point of every branch; tube of corolla white, the upper lip white tipped with purple; the lower lip large, rich deep purple, with a white stripe down the centre. October. *l.* opposite, ovate, dark green, and are, as well as the branches, slightly downy. Brazil, 1855. This species is an excellent subject for training up pillars or rafters; and, when in bloom, makes a pretty basket plant. It has a somewhat straggling habit, but a little care only is needed in pruning and training to grow it into an elegant shape.

A. vasica (Vasica). *fl.* purple. July. *h.* 10ft. India, 1699.

ADHERENT. Strictly signifies sticking to anything, but is more commonly employed in the sense of adnate.

ADHESION. The union of parts usually distinct.

ADIANTOPSIS. *See* **Cheilanthes.**

ADIANTUM (from *adiantos*, dry, as if plunged in water it yet remains dry). Maidenhair. ORD. *Filices.* A large genus of handsome tropical and temperate ferns. Sori marginal, varying in shape from globose to linear, usually numerous and distinct, sometimes confluent and continuous. Involucre the same shape as the sorus, formed of the reflexed margin of the fronds, bearing the capsules on its upper side. None of the Adiantums are truly hardy except the American *A. pedatum*; even our own native species requires protection. The chief requirements of this handsome genus of ferns are good drainage, and a compost of fibrous peat, loam and sand. In most cases, plenty of pot room is essential, and a larger quantity of loam will be needed for strong-growing sorts. For general culture, *see* **Ferns.**

A. æmulum (rival).* *sti.* slender, about 6in. long. *fronds* slender, pyramidate, tri-subquadripinnate; pinnæ distinct, obliquely pyramidate, unequally-sided; pinnules rhomboid or oblong, tapering to the base, the terminal one distinctly cuneate, all sparingly lobate. *sori*, 2in. to 4in., circular, or nearly so. Brazil, 1877. Stove or greenhouse species.

A. æthiopicum (Æthiopian).* *sti.* 6in. to 9in. long, rather slender, erect. *fronds* 12in. to 18in. long, 6in. to 9in. broad, deltoid, tri- or quadripinnate; lower pinnæ 3in. to 4in. long, 2in. to 3in. broad, deltoid; ultimate segments ¼in. to ½in. across, ¼in. deep, suborbicular, the upper part broadly lobed; rachis and surfaces naked. *sori* in several roundish patches. *A. Chilense* (Chilian), *A. scabrum* (scurfy), *A. sulphureum* (sulphured) are mere forms of this species. Spain, and almost cosmopolitan. A very pretty greenhouse fern. SYNS. *A. assimile, A. emarginatum.*

A. affine (related).* *sti.* 6in. to 9in. long, erect. *fronds* with a terminal central pinna 4in. to 6in. long, 1in. to 1½in. broad, and several smaller erecto-patent lateral ones, the lowest of which are again branched; pinnules, ½in. to ¾in. long, ¼in. deep, dimidiate, the lower edge straight, the upper nearly parallel with it, crenate, like the oblique or bluntly rounded outer edge. *sori* numerous, roundish. New Zealand. Greenhouse species. SYN. *A. Cunninghami.*

A. amabile (lovely). Synonymous with *A. glaucophyllum.* Also a garden name for *A. Moorei.*

A. amœnum (pleasing). Synonymous with *A. flabellulatum.*

A. andicolum. A synonym of *A. glaucophyllum.*

A. aneitense (Aneiteum).* *sti.* and *rachises* castaneous, the latter glabrous beneath, ferrugino-pilose above; *fronds* deltoid, three to four pinnate, 1½ft. to 2ft. long, and broad; segments about ½in. long, rhomboidal, ascending, nearly sessile, inner side close to rachis, lower erecto-patent, shallowly lobed. *sori* round, reniform, in centre of lobes, four to six to a segment. Aneiteum Isles, 1880. Stove or greenhouse species.

A. assimile (assimilated). An Australian form of the widely-distributed *A. æthiopicum.*

A. Bausei (Bause's).* *fronds* 1½ft. to 2½ft. long, spreading, triangular, tri-quadripinnate; pinnæ stalked, the lower ones obliquely triangular; pinnules broad, laterally deflexed, the basal ones obliquely ovate with a truncate base, the intermediate somewhat trapeziform, the terminal cuneate—all shallowly lobed and pedicellate. *sori* oblong reniform, set across the apices of the lobes. 1879. A beautiful stove or greenhouse hybrid, between *A. trapeziforme* and *A. decorum.*

A. bellum (handsome).* *fronds* tufted, 3in. to 6in. high, bipinnate, ovate-lanceolate; pinnæ of three to six pinnules, ½in. to 1½in. long, stalked; pinnules cuneate or irregular transverse-oblong, the somewhat larger terminal ones cuneate, lobed, the margin erose, all shortly stalked. *sori* two to three on the smaller pinnules, roundish, or sublunate. Bermuda, 1879. Greenhouse or Wardian case species.

Adiantum—*continued.*

A. Capillus-Veneris (Venus's hair).* Common Maidenhair. *sti.* sub-erect, rather slender, 4in. to 9in. long. *fronds* very variable in size, with short terminal and numerous erecto-patent lateral branches on each side, the lowest slightly branched again; segments ¼in. to 1in. broad, deeply lobed, and the lobes again bluntly crenated. *sori* placed in roundish sinuses of the crenation. Great Britain, and world-wide in its distribution. Greenhouse, case, or frame species.

A. C.-V. cornubiense (Cornish).* *fronds* very numerous, and dwarf, more or less oblong in general outline, with large, broad pinnules of a deep green, with finely-waved margins, and an almost pellucid, but firm texture. One of the best forms, but somewhat delicate in constitution.

A. C.-V. crispulum (crisped).* *fronds*, with the stipes, from 6in. to 12in. long, more attenuated than those of the type, and narrower at the base; pinnules less numerous, but broad and thin, crisp, of a light green colour, more or less cut at the broadest part. A handsome variety, of vigorous growth.

FIG. 26. ADIANTUM CAPILLUS-VENERIS DAPHNITES.

A. C.-V. daphnites (glistening).* *sti.* and *rachises* dark brown, reaching a height of from 9in. to 14in. pinnæ and ultimate pinnules more or less confluent, the latter being broad, and of a dull green colour, usually forming a tufted crest at the extremities of the fronds. A charming subject for the Wardian case. Very distinct. See Fig. 26.

A. C.-V. fissum (divided). Very dwarf in habit, with pinnules rather broader than those of the type, which are deeply and variously cut, so as to give the plant a distinctive appearance from most of the forms.

A. C.-V. Footi (Foot's). Closely allied to the variety *fissum*, having fronds a foot or more long, with very ample pinnules deeply incised, light green. Vigorous.

A. C.-V. incisum (deeply cut). Very closely allied to *A. C.-V. fissum*, but rather more vigorous in growth; pinnules broad, and deeply slit into segments near the base.

A. C.-V. magnificum (magnificent).* *fronds* from 9in. to 16in. long, more or less elongated in outline, 3in. to 4in. across; pinnules ample, rich green, with the margins finely cut and imbricated. The arching character gives this form a most distinct appearance. A very fine variety.

A. C.-V. rotundum (rounded). Pinnules usually round, without the cuneiform base of the normal form; neither are the fronds so broad. Isle of Man. Variable in its habit.

A. C.-V. undulatum (wavy).* *fronds* dense, compact, having broad, roundish dark green pinnules, which are undulated at the edges. An elegant dwarf-growing form.

A. cardiochlæna (heart-form indusium). A synonym of *A. polyphyllum.*

A. caudatum (tailed).* *sti.* 2in. to 4in. long, tufted, wiry. *fronds* 6in. to 12in. long, simply pinnate, often elongated, and rooting at the extremity; pinnæ about ½in. long, ¼in. deep, dimidiate, nearly sessile, the lower line straight and horizontal, the upper rounded, more or less cut, the point usually blunt, the lower ones slightly stalked. *sori* roundish or transversely oblong on the edge of the lobes; *rachis* and both sides of the frond villose. *A. ciliatum*

Adiantum—*continued.*

(of gardens) is probably a mere form, if not a synonym, of this species. Throughout the Tropics everywhere. Greenhouse or stove species; very fine for hanging baskets.

A. colpodes (deep hollow).* *sti.* 4in. to 6in. long, slender, slightly fibrillose. *fronds* 9in. to 18in. long, 4in. to 8in. broad, deltoid, tripinnate, light green; lower pinnæ spreading at right angles from the rachis, 2in. to 4in. long, 1½in. broad, slightly branched below; ultimate segments about ½in. long, ¼in. broad, the lower line often straight, the upper rounded, lobed, and toothed, all nearly or quite sessile. *sori* placed in distinct teeth of the outer edge. Ecuador and Peru, 1875. Greenhouse species.

A. concinnum (neat).* *sti.* 4in. to 8in. long. *fronds* 12in. to 18in. long, 6in. to 9in. broad, ovate-deltoid, tripinnate; pinnæ numerous, spreading, flexuous, the lowest 4in. to 6in. long, 2in. to 3in. broad; segments ¼in. to ⅜in. across, broadly cuneate at the base, the upper edge irregularly rounded, deeply lobed, the lobes crenate, the lowest segment of each pinna and pinnule large, sessile. *sori* numerous, ob-reniform. Tropical America. A most elegant species for baskets and the rockery.

A. c. Flemingi (Fleming's). This variety, of garden origin, is also very handsome.

A. c. latum (broad).* Differs from the type in being more erect and robust in habit, and broader in all its parts. It constitutes an excellent stove plant.

A. crenatum (crenated).* *sti.* 6in. to 9in. long. *fronds* with a terminal central pinna 6in. to 9in. long, and several large erecto-patent lateral ones on each side, the lowest of which are branched again; segments about ½in. long, ¼in. deep, dimidiate, the lower line upcurved, the upper nearly straight, slightly crenate. *sori* numerous, round, placed on the upper and sometimes outer edge. This is closely allied to *A. tetraphyllum.* Mexico. Stove species. SYN. *A. Wilesianum.*

FIG. 27. ADIANTUM DECORUM.

A. cristatum (crested). *sti.* 6in. to 12in. long, strong, erect, tomentose. *fronds* 1½ft. to 3ft. long, 9in. to 12in. broad, with a terminal central pinna 6in. to 9in. long, 1in. to 1½in. broad, and numerous rather distant lateral ones on each side, the lowest of which are sometimes again branched; segments ½in. to ⅔in. long, ¼in. to ⅜in. broad, dimidiate, the lower line nearly straight, the upper nearly parallel or rounded, the point blunt. *sori* in several oblong or linear patches. West Indies and Venezuela, 1844. Stove species. SYN. *A. Kunzeanum.*

A. cubense (Cuba).* *sti.* 4in. to 8in. long, nearly black, erect. *fronds* 6in. to 12in. long, 2in. to 4in. broad, simply pinnate, or with a single pair of short branches; pinnæ 1in. to 2in. long, and about ⅔in. to 1in. broad, unilateral, the lower line slightly recurved, the upper rounded and broadly lobed, of a deep green colour, with a soft herbaceous texture. *sori* in hollows of the lobes. Cuba and Jamaica. A very distinct stove species.

A. cuneatum (wedge-shaped).* *sti.* 6in. to 9in. long, slender, erect. *fronds* 9in. to 18in. long, 6in. to 9in. broad, deltoid, tri- or quadripinnate; lower pinnæ 4in. to 6in. long, 2in. to 3in. broad; segments numerous, ¼in. to ⅜in. broad, cuneate at the base, the upper edge deeply lobed. *sori* four to six, obversely reniform. Brazil, 1820. This fine greenhouse species is more generally grown than any other; and a number of garden forms have received distinctive names.

Adiantum—*continued.*

A. c. dissectum (dissected).* A pretty variety, with the pinnules more deeply lobed than in the type.

A. c. Lawsonianum (Lawson's). This is a very abnormal form, curiously and finely cut, with the ultimate segments narrowly cuneate at the base, stalked, and distant. Of garden origin. Greenhouse variety.

A. c. mundulum (neat).* *sti.* 3in. to 4in. high. *fronds* dwarf, tufted, erect, hardly 3in. broad, deltoid, tripinnate; pinnæ and pinnules crowded; pinnules narrowly cuneate, rarely three-parted, with narrow wedge-shaped lobes; apex slightly crenate, and bears a roundish sorus set in a notch of the lobe or crenature. Of garden origin, 1879. Greenhouse variety.

A. Cunninghami (Cunningham's). Synonymous with *A. affine.*

A. curvatum (curved).* *sti.* 6in. to 12in. long. *fronds* dichotomous, with main divisions again once or twice forked; pinnæ 8in. to 12in. long, 2in. to 3in. broad; pinnules 1¼in. to 1½in. long, about ¼in. deep, not truly dimidiate, but only the lower two-thirds of the under half cut away, the upper margin rounded and broadly lobed, with the lobes finely toothed and point often lengthened out. *sori* linear, or transversely oblong. Tropical America, 1841. Stove species.

A. decorum (decorous).* *sti.* 4in. to 6in. long. *fronds* sub-deltoid, 9in. to 15in. long, three to four pinnate; lower pinnæ and pinnules stalked, deltoid; side segments rhomboid, ¼in. to ⅜in. long; outer edge distinctly lobed; lower segments equilateral, imbricated over main rachis. *sori* round, in final lobes, four to six to a segment. This greenhouse species ranks midway between *A. concinnum* and *A. cuneatum.* Peru. SYN. *A. Wagneri.* See Fig. 27.

A. deltoideum (deltoid). *sti.* densely tufted, 3in. to 4in. long, wiry, erect. *fronds* 4in. to 6in. long, ⅜in. broad, with a terminal lobe and numerous sub-opposite pinnæ, the lower ones distant, distinctly stalked, ¼in. long, ¼in. to ⅜in. broad, hastate-deltoid, cordate or cuneate at the base. *sori* in interrupted lines along the sides of the pinnæ. West Indian Islands. Stove species.

FIG. 28. ADIANTUM DIAPHANUM.

A. diaphanum (transparent).* *sti.* 4in. to 8in. long, slender, erect. *fronds* 6in. to 7in. long, simply pinnate, or with one to three branches at the base; pinnules ⅛in. long, ¼in. broad, the lower line rather decurved, the upper nearly parallel with it, crenate like the blunt outer edge. *sori* obversely reniform, numerous. S.E. China, New Zealand, &c. Greenhouse species. SYN. *A. setulosum.* See Fig. 28.

A. digitatum (finger-leaved).* *sti.* 12in. to 18in. long, erect. *fronds* 1ft. to 3ft long, 6in. to 1ft. 6in. broad, furnished with numerous distant spreading or erecto-patent branches, gradually shortened upwards, the lowest of which are branched again; lower pinnæ 6in. to 9in. long, 3in. to 4in. broad; segments ⅜in. to 1in. each way, varying from deflexed to cuneate at the base, the upper edge rounded, deeply cut, and the lobes again less deeply cut, the lower ones distinctly stalked. *sori* in lines along the edge of the lobes. Peru. It is generally

Adiantum—*continued.*

cultivated under the name of *A. speciosum.* Stove or greenhouse species.

A. dolabriforme (axe-shaped). Synonymous with *A. lunulatum.*

A. dolosum (deceiving). Synonymous with *A. Wilsoni.*

A. Edgworthii (Edgeworth's).* This differs from *caudatum* by having more membranous texture, glabrous surfaces, and subentire pinnæ. Himalaya and China.

A. emarginatum (notched). Synonymous with *A. æthiopicum.*

A. excisum (bluntly cut).* *sti.* 2in. to 3in. long, wiry, densely tufted. *fronds* 6in. to 18in. long, 3in. to 6in. broad, with numerous flexuose short pinnæ on each side, the lowest of which are slightly branched again; segments two to three lines broad, cuneate at the base, the upper edge rounded and bluntly lobed. *sori* two to four, large, obversely reniform, placed in distinct hollows on the lobes. Chili.

A. e. Leyi (Ley's).* This is a very dwarf, copiously crested form, of garden origin, most suitable for case culture. Greenhouse variety.

A. e. multifidum (much-cut).* A handsome garden variety; the apex of every frond is frequently divided into several branches, which oftentimes are again divided and crested, thus forming a beautiful tassel 2in. to 3in. long. Greenhouse species.

A. Farleyense. *See* **A. tenerum Farleyense.**

A. Feei (Fee's).* *sti.* 12in. to 18in. long, strong, scandent. *fronds* 1ft. to 2ft. long, 1ft. or more broad, tripinnate, the main and secondary rachises zigzag, all the branches firm and spreading at a right angle; lower pinnæ 6in. to 9in. long, 3in. to 4in. broad; pinnules 1in. to 2in. long, ¼in. broad, consisting of a terminal segment and several distant suborbicular-cuneate lateral ones. *sori* marginal, roundish, more than half line deep. Tropical America. Stove species. SYN. *A. flexuosum.*

A. fiabellulatum (small fan-leaved).* *sti.* erect, strong. *fronds* dichotomously branched, and the divisions once or twice branched again; central pinnæ 4in. to 8in. long, ⅜in. broad; pinnules about ¼in. broad and deep, dimidiate, the lower edge nearly straight, the upper rounded, the outer blunt, both entire or slightly toothed. *sori* in several transversely oblong notches. Tropical Asia. Stove species. SYN. *A. amœnum.*

A. flexuosum (zigzagly-bent). Synonymous with *A. Feei.*

A. formosum (beautiful).* *sti.* 12in. to 18in. long, strong, erect. *fronds* 18in. to 24in. long, 12in. to 18in. broad, bi-, tri-, or quadripinnate; lower pinnæ 12in. to 15in. long, 6in. to 9in. broad, deltoid; pinnules deltoid; ultimate segments ¼in. to ⅜in. broad, one and a half to two lines deep, dimidiate, the lower edge straight, the upper and outer rather rounded and deeply lobed, the lower ones distinctly stalked. *sori* numerous, between obreniform and transversely oblong. Australia, 1820. Greenhouse species.

A. fovearum. Synonymous with *A. intermedium.*

A. fulvum (tawny).* *sti.* 6in. to 9in. long, strong, erect. *fronds* 9in. to 12in. long, 6in. to 8in. broad, deltoid in general outline, with a terminal pinna 4in. to 6in. long, about 1½in. broad, and several erecto-patent branches, the lower of which are branched again; pinnules about ⅜in. long, ¼in. deep, dimidiate, the lower edge nearly straight, the upper almost parallel, sharply toothed like the oblique outer edge. *sori* large, numerous. New Zealand. Greenhouse species.

A. Ghiesbreghti (Ghiesbreght's).* *fronds* 18in. to 30in. long, ovate, deltoid, tripinnate; pinnules large, slightly crenate on the margins. A very fine stove fern, with the habit of *A. tenerum Farleyense,* but less dense. It is undoubtedly a variety of *tenerum,* having originated in Mr. Williams's nursery some years since. SYN. *A. scutum.*

A. glaucophyllum (grey-leaved).* *sti.* 6in. to 9in. long, erect. *fronds* 12in. to 24in. long, 9in. to 15in. broad, deltoid, quadripinnate; lower pinnæ 6in. to 9in. long, 3in. to 6in. broad, deltoid, erecto-patent; segments ¼in. broad, cuneate at the base, the upper edge irregularly rounded, more or less lobed. *sori* four to six, obversely reniform, placed in distinct hollows in the apex of the lobes of the upper edge, deep green above, glaucous beneath. Closely allied to *A. cuneatum.* Mexico. Greenhouse. SYNS. *A. amabile, A. andicolum, A. mexicanum.*

A. gracillimum (most graceful).* *fronds* deltoidly ovate, 9in. to 24in. long, and 6in. to 10in. across, decompound, rich green; ultimate pinnules distant, minute, distinctly stalked, obovate, emarginate, or two to three lobed, the sterile lobes blunt. *sori* solitary on the entire pinnules, two to three on the larger lobed ones. One of the most graceful and beautiful of greenhouse ferns; the very numerous minute segments and the ramifications of the rachis impart to a well grown plant a very charming appearance. Of garden origin. A form of *A. cuneatum.*

A. Henslovianum (Henslow's).* *sti.* 6in. to 12in. long, erect. *fronds* 12in. to 18in. long, 6in. to 9in. broad, ovate, tripinnate, furnished with numerous distant pinnæ on each side, the upper of which are simple, but the lowest slightly branched; segments ¼in. to ⅜in. broad, ¼in. to ⅜in. deep, dimidiate, the lower line nearly straight, the upper rather rounded and lobed, the point bluntly rounded. *sori* obversely reniform, placed in the hollows of the lobes. Columbia, Peru, &c., 1833. A most distinct and beautiful stove species. SYNS. *A. lætum, A. Reichenbachii, A. sessilifolium.*

A. Hewardia (Heward's). *sti.* 6in. to 9in. long, erect. *fronds* simply pinnate or bipinnate, with a terminal pinna and two to four lateral ones on each side, the lowest pair of which sometimes with

Adiantum—*continued.*

two to four pinnules each; pinnules 3in. to 4in. long, about 1in. broad, nearly equal sided, ovate lanceolate, nearly entire. *sori* in continuous lines along both edges. Jamaica, &c., occurring over a wide area. Stove species. SYN. *Hewardia adiantoides.*

A. hispidulum (hairyish).* *sti.* 6in. to 15in. long, strong, erect. *fronds* dichotomous, with the main divisions flabellately branched; central pinnæ 6in. to 9in. long, ¼in. to 1in. broad; pinnules ⅜in. to ½in. long, two to four lines broad, dimidiate, subrhomboidal, the outer edge bluntly rounded, upper and outer margin finely toothed, slightly stalked. *sori* roundish, numerous, contiguous. Tropics of Old World, 1822. Greenhouse. SYN. *A. pubescens.*

A. intermedium (intermediate). *sti.* 6in. to 12in. long, erect, strong. *fronds* with a terminal pinna 6in. to 9in. long, 2in. to 3in. broad, and one to three small spreading lateral ones on each side; pinnules 1in. to 1½in. long; ¼in. to ½in. broad, unequal sided, but not dimidiate, the point bluntish or acute, the inner edge nearly parallel with the stem, the upper nearly straight, scarcely toothed. *sori* in interrupted marginal patches, one to two lines across, placed round the upper and lower edges. Stove. Tropical America, from the Antilles southwards to Peru and Rio Janeiro, 1824. SYNS. *A. fovearum, A. triangulatum.*

A. Kunzeanum (Kunze's). Synonymous with *A. cristatum.*

A. lætum (joyful). Synonymous with *A. Henslovianum.*

A. Lathomi (Lathom's).* A garden variety, said to be a sport from *A. Ghiesbreghti*, which it closely resembles, being between it and *A. Farleyense.* It is a magnificent plant, producing fronds from 18in. to 24in. long, with imbricated deeply-cut pinnules. Stove variety.

A. Legrandi (Legrand's). Very closely allied to, if not identical with, *A. Pecottei.* Greenhouse variety, of garden origin.

A. Lindeni (Linden's).* *sti.* black, naked. *fronds* erect, large, pentagonal, tripinnate; rachises pubescent above, naked beneath; segments sub-distant, 1½in. long, oblong-rhomboidal, falcate, acuminate, outer margins closely but bluntly lobed, of a deep green colour, the lobes toothed. *sori* oblong or reniform. Amazons, 1866. A magnificent stove species.

A. lucidum (shiny).* *sti.* 6in. to 9in. long, strong, erect. *fronds* 9in. to 15in. long, 4in. to 8in. broad, simply pinnate, with a large terminal pinna and six to ten lateral ones on each side, or the lowest very slightly branched, 3in. to 4in. long, ½in. to 1in. broad, nearly equal sided, lanceolate acuminate, slightly serrated towards the point. *sori* in a continuous row along each side. West Indian Islands and Tropical America. Stove species

FIG. 29. ADIANTUM LUDDEMANNIANUM.

A. Luddemannianum (Luddemann's).* A very striking variety of the common Maidenhair, *A. Capillus-Veneris*, of garden origin, with smooth, dark, almost black stipes, branching about a third of the way up, while the pinnules are crested, usually clustered, at the extremities of the branches, of a deep green, sub-glaucous character. It is a very elegant little greenhouse variety. See Fig. 29.

A. lunulatum (crescent-leaved).* *sti.* 4in. to 6in. long, tufted, wiry. *fronds* 6in. to 12in. long, 1in. to 2in. broad, simply pinnate; pinnæ ⅜in. to 1in. broad, ½in. to 1in. deep, sub-dimidiate, the lower edge nearly in a line with the petiole, the upper edge rounded

Adiantum—*continued.*

and, like the sides, usually more or less lobed. *sori* in continuous lines along the edge. Hongkong, &c., widely distributed in both hemispheres. Stove species. SYN. *A dolabriforme.*

A. macrocladum (long-branched). Synonymous with *A. polyphyllum.*

A. macrophyllum (long-leaved).* *sti.* 6in. to 12in. long, strong, erect, nearly black. *fronds.* 9in. to 15in. long, 4in. to 8in. broad, simply pinnate; the lower pinnæ of the barren frond 3in. to 4in. long, 2in. broad, ovate, so broad at the base that the opposite ones frequently overlap, the margin rather deeply lobed; fertile ones narrower. *sori* in long continuous, or slightly interrupted, marginal lines. Tropical America, 1793. One of the finest stove species in cultivation.

A. macropterum (long-winged). Synonymous with *A. Wilsoni.*

A. mexicanum (Mexican). Synonymous with *A. glaucophyllum.*

A. microphyllum (short-leaved). A synonymn of *A. venustum.*

A. monochlamys (one-covered).* *sti.* 6in. to 9in. long, wiry, erect, dark, chestnut brown; *fronds* 6in. to 12in. long, 4in. to 6in. broad, ovate-deltoid, tripinnate, the pinnæ rather distantly placed; segments ¼in. broad, cuneate at the base, the upper edge rounded, slightly toothed, of a light green colour, with a firm texture. *sori* single, or very rarely two, in a hollow of the upper edge. Japan. A very distinct and pretty greenhouse species.

A. monosorum (uni-soriate). A pretty species, from Solomon Islands, not yet in cultivation.

A. Moorei (Moore's).* *sti.* 6in. to 8in. long. *fronds* deltoid, 6in. to 15in. long, two to three pinnate; side segments about ½in. long, rhomboid, lower edge deflexed from tip of pedicel, outer lobed half way down. *sori* round, placed in tip of lobes. Andes of Peru. Stove or greenhouse species. SYN. *A. amabile*, under which name it is frequently grown.

A. Moritzianum (Moritz's). This appears to be a stronger, more robust grower (fronds from 12in. to 18in. high), with thicker stipes and larger pinnules than the typical *A. Capillus-Veneris.* South America. Greenhouse species.

A. neoguineense (New Guinea).* *sti.* 6in. to 8in. long, chestnut brown, erect. *fronds* spreading, deltoid, tri-quadripinnate, dark olive green, with a glaucous tinge on both surfaces; pinnæ ovate; terminal pinnules cuneate, lateral ones trapezoid, about ½in. long, crenately lobed, the lobes rather large, entire. *sori* small, 6in. to 8in., orbicular, entirely sunk in closed sinuses of the marginal lobes. New Guinea, 1877. A very charming stove species.

A. obliquum (oblique). *sti.* 3in. to 6in. long, erect, wiry, pubescent. *fronds* 6in. to 12in. long, 2in. to 4in. broad, with a terminal lobe and three to twelve pairs of alternate pinnæ, the lowest 1in. to 2in. long, ½in. to ⅝in. broad, costate nearly to the apex, the upper half the largest, rounded at the base, the lower half obliquely truncate at the base, those of the barren frond slightly toothed. *sori* in numerous interrupted marginal patches, one to two lines broad. West Indies, &c., 1826. Stove species.

A. Pacottii (Pacot's).* This is a charming little variety, of garden origin, with short decompound fronds, imbricated segments, comparatively large, of a deep green colour, and likely to prove one of the most useful maidenhair ferns grown.

A. palmatum (palmate).* *fronds* with elongated zigzag rachises, elongate-oblong, narrowed to the apex, tripinnate, often reaching 3½ft. long, 10in. broad; pinnules distinct; ultimate segments large, smooth, distant, distinctly stipitate, varying from obovate wedge-shaped to semi-orbicular in outline, but all deeply, palmately cut, 1in. to 1¾in. broad. *sori* oblong, variable in length, situate at the tips of the segments, usually one to each. This is a very beautiful and graceful stove or greenhouse species. Peru, 1877.

A. patens (spreading). *sti.* 6in. to 9in. long, erect. *fronds* dichotomously divided and the branches once or twice divided again; central pinnæ 6in. to 9in. long, 1½in. broad; pinnules ½in. to ⅝in. long, ¼in. deep, dimidiate, the two sides nearly parallel, the upper and outer ones broadly and bluntly lobed. *sori* placed round the upper and outer edge, obversely reniform. Brazil, &c., 1824. Stove species.

A. pedatum (pedate).* *sti.* 9in. to 24in. long, erect, polished. *fronds* dichotomous, with the main divisions flabellately branched; central pinnæ 6in. to 12in. long, 1in. to 1½in. broad; pinnules ½in. to ⅝in. long, ¼in. deep, dimidiate, broadest on the side nearest the stem, the upper and outer margin lobed, shortly stalked. *sori* roundish, one to two lines broad. North Hindostan, the United States, &c. Hardy species. See Fig. 30.

A. peruvianum (Peruvian).* *sti.* 9in. to 18in. long, strong, erect. *fronds* simply pinnate, or with one to three branches at the base, some of the latter sometimes again slightly divided; pinnules 2in. or more broad, 1½in. deep, unequally ovate, cuneate at base, finely toothed and lobed round the upper and outer edge. *sori* in interrupted patches round the sides of the pinnules. Peru. This is one of the finest of the large growing, evergreen stove kinds.

A. polypnyllum (many-leaved).* *sti.* 12in. to 18in. long, strong, erect. *fronds* 2ft. to 3ft. long, 12in. to 18in. broad, the upper part simply pinnate; lower pinnæ sometimes 1ft. long. 6in. broad, with a long terminal and numerous lateral pinnules; segments ⅜in. to 1in. long, ¼in. deep, dimidiate, with nearly parallel edges, the point obtuse, the upper edge sharply toothed. *sori* in numerous sub-orbicular patches, placed in hollows in lobes along

Adiantum —*continued.*

the upper edge. Columbia. A magnificent stove species. SYNS. *A. cardiochlæna* and *A. macrocladum.*

A. populifolium (poplar-leaved). A synonym of *A. Seemanni.*

A. princeps (Princely).* *sti.* 9in. to 12in. long, stout, nearly erect. *fronds* large, 12in. to 24in. long, 9in. to 18in. across the base, deltoid, pendent, quadripinnate, pale greyish; lower pinnæ obliquely elongate, triangular, the posterior side tripinnate, the anterior bipinnate; upper ones pinnate, with a large cuneately flabellate terminal pinnule, apex of fronds pinnate; pinnules 1in. long, ¾in. broad, roundish rhomboidal or shortly trapeziform, shortly stalked; basal margin entire, slightly concave, the anterior margins and apex lobate, the lobes serrulate in the sterile parts, and, where fertile, bearing each a concave sorus, so that the lobes appear two-horned. New Grenada, 1875. A magnificent stove species.

A. prionophyllum (saw-leaved). Synonymous with *A. tetraphyllum.*

A. pubescens (downy). Synonymous with *A. hispidulum.*

A. pulverulentum (covered with powder).* *sti.* 6in. to 12in. long, strong, erect; *fronds* with a terminal pinna and several spreading lateral ones on each side, which are 4in. to 8in. long, 1in. broad; pinnules ½in. long, one and a half to two lines deep, dimidiate, the lower line nearly straight, the upper one nearly parallel, both it and the outer edge finely toothed. *sori* in a continuous line along the lower and upper edges. West Indies, &c. Stove species.

FIG. 30. ADIANTUM PEDATUM.

A. Reichenbachii (Reichenbach's). Synonymous with *A. Henslovianum.*

A. reniforme (kidney-shaped).* *sti.* tufted, 4in. to 9in. long. *fronds* simple, orbicular, reniform, of a deep green colour, 1½in. to 2½in. across, with usually a broad, open sinus. *sori* all around the edge, one and a half to three lines broad. Madeira, &c., 1699. Greenhouse species.

A. r. asarifolium (Asarum-leaved). A rather larger growing variety of above species.

A. rhomboideum (rhomboid). S. America, 1820. Probably identical with *A. villosum.*

A. rubellum (reddish).* *sti.* 4in. to 6in. long. *fronds* 4in. to 6in. long, deltoid, bipinnate; uppermost side of the pinnules cuneate, flabellate, nearly sessile, entire; lower rhomboid ¼in. long, with lower border in a line with petiole, or rather decurved, inner produced over rachis, outer deeply lobed and finely toothed; end and lowest pinnules deltoid, ¼in. broad. *sori* round, placed in the tips of the lobes. This pretty species is purplish crimson when in a young state, changing to light green with age, but even then tinged with pink. Allied to *A. tinctum* and *A. decorum.* Bolivia, 1868. Greenhouse species.

Adiantum—*continued.*

A. scutum (shield). Synonymous with *A. Ghiesbreghti.*

A. Seemanni (Seemann's).* *sti.* 6in. to 12in. long, erect. *fronds* 9in. to 20in. long, simply pinnate or the lower pinnæ compound; pinnæ 3in. to 4in. long, 1½in. to 2in. broad, ovate, acuminate; but rather unequally sided, the barren ones finely serrated, one side usually cordate at the base, the other obliquely truncate, petioles of the lowest, nearly an inch long. *sori* in long continuous marginal lines. This is a very fine and distinct stove species. Central America, 1868. SYNS. *A. populifolium, A. Zahnii* (of gardens).

A. sessilifolium (sessile-leaved). Synonymous with *A. Henslovianum.*

A. setulosum (bristly). Synonymous with *A. diaphanum.*

A. speciosum (showy). Synonymous with *A. digitatum.*

A. subvolubile (somewhat twining). *fronds* subscandent, 2ft. to 4ft. long, oblong, tripinnate, 6in. to 8in. broad, with naked glossy castaneous stipes and zigzag rachises; central pinnæ lanceolate, with a few short spreading pinnules; side pinnules rhomboidal, about ¼in. long, lower edge in a line with petiole, or deflexed, inner end touching or wrapped over rachis, outer shallowly lobed; lowest pinnules equilateral, much wrapped over rachis. *sori* minute, round, six to twelve to a segment. E. Peru. Stove species.

A. tenerum (tender).* *sti.* 1ft. or more high, erect. *fronds* 1ft. to 3ft. long, 9in. to 18in. broad, deltoid, tri- or quadripinnate; segments ½in. to ¾in. broad, cuneate or tending towards rhomboidal, dimidiate in shape, the upper edge rounder or somewhat angular, broadly and deeply lobed, all stalked. *sori* placed in numerous roundish patches in the lobes of the upper half. Mexico, &c., widely distributed. Stove species.

A. t. Farleyense (Farley's).* A subfertile, subcristate variety of the foregoing; but, is, nevertheless, one of the most magnificent of Adiantums. It is nearly always known under the name of *A. Farleyense.* Barbados, 1865. Stove variety.

A. tetraphyllum (four-leaved).* *sti.* 6in. to 12in. long, strong, erect. *fronds* nearly as broad as long, with a terminal pinna 6in. to 9in. long, 1in. to 1½in. broad, and numerous spreading lateral ones; segments ½in. to ¾in. broad, ¼in. deep, subdimidiate, the lower line straight or somewhat decurved, the upper nearly parallel, finely toothed, the outer oblique. *sori* interrupted, marginal. Tropical America. Stove species. SYN. *A. prionophyllum.*

A. t. Hendersoni (Henderson's). A stove variety with small blunt pinnules.

A. tinctum (tinted).* *sti.* 6in. to 9in. long. *fronds* 6in. to 12in. long, deltoid, bipinnate; side pinnules rhomboid, three to four lines long, lower edge straight, inner parallel with rachis, or just wrapped over it, outer shallowly, bluntly lobed; lower pinnules equilateral, imbricated over main rachis; surfaces glabrous, when young of a delicate rose red colour, changing to a bright green. *sori* round, placed in final lobes. Tropical America. Stove or greenhouse species.

A. trapeziforme (rhomb-leaved).* *sti.* 6in. to 12in. long, firm, erect. *fronds* 12in. to 24in. long, with a central pinna 4in. to 8in. long, 2in. to 3in. broad, and two to four large spreading ones on each side, the lowest of which are often branched again; segments 1½in. to 2in. long, ½in. to ¾in. broad, dimidiate, the sides nearly parallel, the outer edge oblique, both it and the upper one bluntly lobed, the lowest on stalks ½in. to ½in. long. *sori* numerous, contiguous, placed round the upper and outer edge. West Indies, 1793. Stove species.

A. t. cultratum (sharpened).* Outer edge of the segment bluntly rounded.

A. t. pentadactylon (five-fingered). Lower margin of the segments somewhat decurved obliquely from the petiole.

A. t. Sanctæ Catherinæ (of gardens).* This is a deeply cut, rather copiously divided variety of *A. trapeziforme.*

A. t. S. C. Funcki (Funck's).* A deeply lobed, drooping variety, of garden origin.

A. triangulatum (triangle-leaved). Synonymous with *A. intermedium.*

A. varium (various). Probably identical with *A. villosum.*

A. Veitchianum (Veitch's).* *sti.* 6in. to 9in. long. *fronds* 9in. to 18in. long, deltoid, bipinnate in lower half, reddish when young; side pinnules rhomboid, about ½in. long, lower border straight, more or less deflexed from tip of pedicel, inner distant from rachis, upper and outer shallowly lobed; end segments ½in. to ¾in. broad, equilateral, rounded in upper, deltoid in lower half. *sori* eight to ten to a segment, round, minute. Peruvian Andes, 1868. A very elegant and distinct stove species.

A. velutinum (velvety).* *sti.* as long as fronds, slightly velvety. *fronds* deltoid, 1½ft. to 2ft. long, three to four pinnate; rachises densely pubescent on both sides; pinnæ 6in. to 9in. long; segments twenty to thirty-jugate, sub-sessile, sub-rhomboidal, 1in. long, ½in. broad, lower border decurved, outer blunt or sub-acute, upper straight, shallowly, bluntly lobed. *sori* straight, one to one and a

Adiantum—*continued.*

half lines long at tips of lobes of upper edge, four to six to a segment. Columbia, 1866. A magnificent stove species.

A. venustum (charming).* *sti.* 6in. to 9in. long, wiry, erect, glossy. *fronds* 6in. to 12in. long, 4in. to 8in. broad, deltoid, tri-quadripinnate; ultimate segments about ¼in. across, cuneate at the base, the upper edge rounded, and usually finely toothed, of a light green colour, with a firm texture. *sori* one to three, roundish; in hollows of the upper edge. Himalayas, up to 8000ft. Greenhouse or frame, nearly hardy in sheltered places. SYN. *A. microphyllum.*

A. villosum (hairy stalked).* *sti.* 9in. to 12in. long, strong, erect. *fronds* with a terminal central and several spreading pinnæ on each side, 6in. to 12in. long, 1½in. to 2in. broad; pinnules dimidiate, about 1in. long, ½in. broad, the lower line nearly straight, the upper edge nearly parallel with it, but considerably larger, slightly toothed, and the outer edge auriculed at the base. *sori* in a continuous line round the upper and outer edge. West Indies, &c., 1775. Stove species.

A. Wagneri (Wagner's). Synonymous with *A. decorum.*

A. Wilesianum (Wiles's). Synonymous with *A. crenatum.*

A. Williamsii (Williams's).* *sti.* 6in. to 8in. long. *fronds* 9in. to 18in. long, tripinnate, triangular; pinnæ ovate, distant, pinnules sub-rotund, slightly trapeziform, the basal line rather concave, the margin entire or slightly undulated, or divided into three to four lobes, crenately notched between the sori, the sterile portions with an erose diaphanous margin. *sori* eight to ten, elongate reniform or lunate, occupying the whole of the semicircular outer edge. Mountains of Peru, 1877. In a young state, the stipes and fronds are dusted with a yellow powder. This is one of the most beautiful of the Maidenhair ferns. Greenhouse species.

A. Wilsoni (Wilson's).* *sti.* 6in. to 12in. long, erect. *fronds* 9in. to 12in. long, 6in. to 12in. broad, simply pinnate, with a large terminal pinna and two to six sub-sessile lateral ones on each side, which are 4in. to 6in. long, 1in. to 2in. broad, ovate or ovate-lanceolate, acuminate, nearly entire. *sori* in continuous lines along both edges. Jamaica. Stove species. SYNS. *A. dolosum, A. macropterum.*

A. Zahnii (Zahn's). Synonymous with *A. Seemanni.*

ADIKE. A synonym of **Pilea** (which *see*).

ADINA (from *adinos*, crowded; in reference to the flowers being disposed in heads). ORD. *Rubiaceæ.* A very pretty evergreen cool stove shrub, with opposite terete branches, and solitary, axillary peduncles. It thrives in a mixture of loam, sand, and peat. Propagated by cuttings, inserted in a rich, loamy soil, under a hand glass, in heat.

A. globifera (globe-bearing).* *fl.* yellowish, sessile, crowded, collected into globose heads; corolla funnel-shaped; peduncles axillary, rarely terminal, solitary. July. *l.* lanceolate, glabrous, longer than the peduncles. *h.* 3ft. to 4ft. China, 1804.

ADLUMIA (from *adlumino*, to fringe with purple; flowers bordered with purple). ORD. *Fumariaceæ.* An interesting, delicate, and nearly hardy climber from North America. Flowers with four spongy, cohering petals. A warm, good soil is most suitable; sow seeds about May in a shady spot. It is a biennial, but in favourable spots is self-sowing, and thus may be treated as a perennial. If placed either against a wall or in the open it is a pretty subject for trailing over a shrub or twiggy branch. From its fragile character, it can only be seen to the best advantage under glass.

A. cirrhosa (tendrilled).* *fl.* pale rose-coloured, about ½in. long; peduncles axillary, generally four-flowered. June. *l.* tripinnate, pale green. *h.* 15ft. 1788. The Maidenhair Fern-like leaves are borne in profusion on the slender twining stems. SYN. *Corydalis fungosa.*

ADNATE. Grown to anything by the whole surface; anthers are said to be Adnate when they are attached to the filaments by their whole length.

ADONIS (name of classical derivation). ORD. *Ranunculaceæ.* Handsome hardy herbaceous plants. Flowers solitary, terminal; petals five to fifteen. Leaves divided into numerous linear segments. Some of the annuals are much inferior to the perennial species. The latter section constitute very ornamental subjects for rockwork, borders, margins of shrubberies, &c. All the species will grow freely in common soil, and are propagated by seeds. The perennials may be divided at the root.

A. æstivalis (summer).* Pheasant's Eye. *fl.* deep crimson; petals flat, oblong, obtuse, one-half longer than the calyx. June. Stem almost simple, elongated. *h.* 1ft. South Europe, 1629. Annual. See Figs. 31 and 32.

Adonis—*continued.*

A. autumnalis (autumnal).* Pheasant's Eye; Red Morocco. *fl.* of an intense blood-red, with a black centre, rarely pale, globose from the six to eight concave conniving petals, which are scarcely larger than the calyx. May. Stems branched. *h.* 1ft. Britain. Annual.

A. pyrenaica (Pyrenean).* *fl.* almost sessile, yellow; petals eight to ten, smaller and more obtuse than in *A. vernalis.* July. *l.*, lower ones on long stalks, with trifid petioles and many-parted segments; upper ones sessile, multifid, with linear very entire lobules. Stem 1ft. or more high, and usually much branched. Pyrenees, 1817. Perennial.

FIG. 31. FLOWER OF ADONIS ÆSTIVALIS.

A. vernalis (spring).* *fl.* yellow, large; petals, ten to twelve, oblong, rather denticulated. March. *l.* lower ones abortive, or reduced to somewhat sheathing scales, the middle and upper ones sessile and multifid, with very entire lobes. *h.* 9in. to 1ft. Europe, 1629. Charming rock plant. This handsome species requires a rich moist sandy loam, and should not be disturbed for years. Perennial.

FIG. 32. ADONIS ÆSTIVALIS, showing Habit and Flowers

A. v. sibirica (Siberian) differs only in having larger flowers.

A. volgensis (Volga). An intermediate species between *A. vernalis* and *A. pyrenaica*, differing from the first in the stems being branched, leaves more distant; from the last by the lower leaves being abortive, and formed like scales; and from both in the sepals being pubescent on the outside, not smooth. *fl.* yellow. *h.* 1ft. Russia, 1818.

ADPRESSED. Brought into close contact with anything without adhering.

ADULT. The full grown of anything. Full grown leaves are termed adult.

ADVENTITIOUS. Developed in an unusual position. Applied to buds, roots, &c.

ADVENTURE BAY PINE. *See* **Phyllocladus rhomboidalis.**

ADVERSE. Opposite.

ÆCHMEA (from *aichme*, a point; in reference to the rigid points on the calyces, or flower-envelopes). Including *Pironneava*. ORD. *Bromeliaceæ*. Very handsome stove plants. Flowers scapose, panicled; perianth six-cleft, three outer segments sepaloid, longer than the three inner or petaloid ones. Leaves ligulate or sword-shaped, sometimes with marginal spines. The species thrive best in a well-drained compost of rich fibrous loam and leaf mould They like plenty of light, which may be afforded by standing them on inverted pots, so as to raise their heads well up above the surrounding plants. Propagation: When the flower-spikes, which are sent up from the heart or crown of the plant, die away, suckers or offsets are produced near the base, and from these other flowers appear the year after. If large plants are desired, these suckers should be left to grow and spread around; but to produce single plants, the suckers must be taken off and potted singly, in sharp soil, and then stood where they can

FIG. 33. ÆCHMEA FULGENS.

get a moist heat till rooted. To enable them to do this it is necessary to strip off a few of the lower leaves, and trim the bottom with a sharp knife, in order that it may heal over and callus more readily than it otherwise would. When rooted, the plants may be shifted into larger-sized pots; but for single crowns 32-sized pots are large enough, as the plants, being epiphytal in their nature, do not require much soil or any great supply of water, except when growing freely or sending up their flower-spikes. In winter, they should be kept rather on the dry side, to induce partial rest; and an important point is to see that water is not allowed to lie for any length of time in the crown of the plant, as when that is the case it is likely to cause them to rot.

Æ. calyculata (calycled).* *fl.* bright yellow, tubular, with red bracts, borne in close roundish heads at the top of an erect scape. *l.* strap-shaped, with the ends having the appearance of being cut off, but armed with a sharp spine. *h.* 9in. Brazil, 1862. SYN. *Hoplophytum calyculatum.*

Æ. cœlestis (heavenly blue).* *fl.* sky-blue, in close pyramidal panicles, on erect scapes. Winter. *l.* ligulate, concave, spiny-edged, scaly beneath. Brazil, 1874. SYN. *Hoplophytum cœleste.*

Æ. cœrulescens (bluish). *fl.* bluish. *h.* 1ft. South America, 1870. This pretty species is very attractive on account of the large

Æchmea—*continued.*

dense head of deep blue and pure white berries which are produced in October. SYN. *Lamprococcus cœrulescens.*

Æ. discolor (two-coloured-leaved).* *fl.* scarlet, borne on a loose, branched panicle. June. *l.* broad, minutely toothed on the margin, deep green above, and rather purplish beneath. *h.* 2ft. Brazil, 1844.

Æ. distichantha (two-ranked-flowered).* *fl.* sepals rose-coloured; petals bright purple; spikes densely clothed with bright red bracts. *l.* long, glaucous, linear-oblong, tapering to a sharp point, and distinctly armed with reddish brown spines. *h.* 1ft. South Brazil, 1852. SYN. *Billbergia polystachya.*

Æ. exudans (exuding). *fl.* orange-coloured (exuding a white greasy substance, whence the specific name) interspersed with green bracts; scape erect, with scattered crimson lanceolate bracts, terminating in a dense head. *l.* oblong, spine-margined, grey-coated. *h.* 2ft. West Indies, 1824. SYN. *Hohenbergia capitata.*

Æ. fasciata (banded).* *fl.* scape upright, clothed with leafy bracts of a rosy-pink colour; each of the pink blossoms in the dense conical head is subtended by a narrow, spiny-edged, similarly-coloured bract, longer than its own. *l.* broad, recurved, banded with white. Rio Janeiro, 1826. SYN. *Billbergia fasciata.* Lasts in perfection for a considerable length of time.

Æ. fulgens (glowing).* *fl.* deep rich red, with a bluish tip, fifty or more in a large branching panicle; scape stout, erect, scarlet. August, September. *l.* somewhat sword-shaped, terminating rather abruptly. Cayenne, 1842. See Fig. 33.

Æ. Furstenbergi (Furstenberg's). *fl.* rose; flower spike dense, with overlapping showy pink bracts. *l.* tufted, linear, spinous at the edge, recurved. *h.* 1ft. Bahia, 1879.

Æ. glomerata (glomerate).* *fl.* violet; scape erect, stout, 8in. to 10in. high, with glomerate branches of crowded blood-red bracts. *l.* oblong-ligulate, cuspidate, about 18in. long, dull green; margin with short wide-set spines. Bahia, 1868. SYN. *Hohenbergia erythrostachys.*

Æ. hystrix (bristly).* *fl.* in very dense, oblong spikes; floral leaves and bracts scarlet. February. *l.* densely crowded, ascending, linear lanceolate, saw-toothed. *h.* 2½ft. Cayenne, 1880.

Æ. Legrelliana (Legrell's). A synonym of *Portea Legrelliana.*

Æ. Lindeni (Linden's). *fl.* yellow, in dense terminal heads, with lanceolate red bracts, shorter than the flowers. *l.* linear-oblong, rounded, apiculate; margins saw-toothed; habit tufted. *h.* 1ft. South Brazil, 1864.

Æ. Mariæ Reginæ (Queen Maria's).* *fl.* tipped with blue, changing to salmon colour with age, arranged compactly upon the upper portion of the spike; scape erect, about 2ft. high; half the length is clothed with large boat-shaped bracts, some 4in. long, intensely rich rose-pink. June, July. *l.* 18in. long, with a tufted habit. Costa Rica, 1873. This is perhaps the best species.

Æ. Melinoni (Melinon's). *fl.* bright scarlet, tipped with pink, cylindric; panicle dense, terminal. *l.* oblong, leathery, about 18in. in length, dark green; margin spiny. South America.

Æ. Ortgiesii (Ortgies'). *fl.* red, on short spikes. *l.* numerous, channelled, recurved, spongy, broad at the base, and tapering to a point; stem short, gouty. Tropical America, 1860. SYN. *Ortgiesia tillandsioides.*

Æ. paniculigera (panicled). *fl.* rose-coloured; petals projecting beyond the sepals, deep bright purple; panicle large, compound, 1ft. to 2ft. long; scape reddish, downy; rachides and bracts rose-coloured. *l.* ligulate, shortly acuminate. West Indies, 1881.

Æ. spectabilis (showy).* *fl.* rosy; calyx fleshy, ovate; corolla 1in. long, rosy crimson. *l.* spreading, channelled, ligulate, 2½ft. long, 3in. to 4in. broad. Guatemala, 1875.

Æ. Veitchii (Veitch's).* *fl.* scarlet; spike densely clothed with scarlet toothed bracts, closely investing flowers. *l.* tufted, leathery in texture, broadly strap-shaped, spotted, and minutely serrulate. *h.* 1ft. Columbia, 1877. SYN. *Chevalliera Veitchii.*

ÆGICERAS (from *aix*, a goat, and *keras*, a horn; alluding to the shape of its fruit). ORD. *Myrsineæ*. Small trees, with obovate entire leaves. Flowers white, fragrant, in terminal or axillary umbels. For culture, *see* **Jacquinia.**

Æ. fragrans (fragrant). *fl.* white, fragrant; umbels pedunculate, axillary, terminal. April. *l.* obovate, margin undulated, and unequally dilated, veiny; upper surface covered with saline excrescence. *h.* 6ft. New Holland, 1824.

ÆGILOPS. *See* **Quercus Ægilops.**

ÆGIPHILA (from *aix*, a goat, and *philos*, dear; a favourite with goats). ORD. *Verbenaceæ*. Stove ornamental evergreen shrubs, generally with ovate-lanceolate, acuminate, smooth leaves; and flowers in axillary and terminal panicles. They require a rich sandy loam. Propagated from cuttings, which will root in sand, under a glass, with bottom heat.

Æ. grandiflora (large-flowered).* *fl.* yellow, terminal, corymbose; corolla downy. November. Berry compressed, blue. *l.* verti-

Ægiphila—*continued.*

cillate oblong, entire, sub-cordate at base. *h.* 3ft. Havannah, 1843. The other species are probably not now in cultivation, and this one is not generally so.

ÆGLE (from Ægle, one of the Hesperides). Bengal Quince. ORD. *Rutaceæ*. A stove evergreen tree, producing very large fruit, which much resembles an orange in general appearance, very delicious to the taste, and exquisitely fragrant. This genus differs principally from *Citrus* by its numerous disunited stamens. The pulp of the fruit is an aperient, and a valuable remedy in dysentery, the thick rind and the dried unripe fruit are astringent. It thrives best in a rich loamy soil. Propagated by ripe cuttings, which, if not deprived of any of their leaves, will root in sand under a hand glass, in heat.

Æ. Marmelos (Marmelos). *fl.* white, very fragrant; panicles axillary, terminal. April. *fr.* fifteen-celled. *l.* trifoliate; leaflets toothletted. *h.* 10ft. India, 1759.

ÆOLANTHUS (from *aiollo*, to vary, and *anthos*, a flower; referring to the variableness of the flowers). ORD. *Labiatæ*. A genus of few herbs, with thickish leaves. Flowers loosely panicled. They thrive in sandy loam, and increase freely from seeds sown in a similar compost.

Æ. Livingstonii (Livingstone's). *fl.* brown. East Africa, 1859.

Æ. suaveolens (sweet-scented). *fl.* lilac, secund; cymes axillary and terminal, erect, usually trifid, with floral leaves under the divisions. July. *l.* nearly sessile, obovate, obsoletely denticulated, thickish, pale green. *h.* 1ft. Brazil, 1859. A pretty stove annual, with a sweet odour.

AERANTHUS (from *aer*, air, and *anthos*, a flower; referring to the habit). ORD. *Orchideæ*. A genus of a couple of species of remarkable stove Orchids, requiring treatment similar to **Angulоa**, to which they are allied.

Æ. arachnitis (spider-like). *fl.* green. *l.* linear. *h.* 4in. Madagascar, 1850.

Æ. grandiflora (large-flowered).* *fl.* yellowish-green, large, solitary, terminal. *h.* 8in. Madagascar, 1823.

AERATION. The exposure of the soil to the free action of the air, as essential to the growth of plants.

AERIDES (from *aer*, the air; in reference to the power the species have of deriving their sustenance from the atmosphere). ORD. *Orchideæ*. An extensive genus of epiphytal Orchids, confined to the tropics of the Old World, including many large and showy-flowered species. The majority of them are extremely handsome. The thick fleshy leaves are noteworthy for their characteristically distichous arrangement—that is to say, they are arranged in two opposite rows. They are usually truncate at the apex, and for the most part deeply channelled down the centre, but in some species terete or nearly cylindrical. All of them throw out large fleshy roots from various parts of their stems, by which they absorb the moisture from the atmosphere; and, in order to grow them successfully, they must be fixed upon blocks of wood. But this method should be adopted only whilst the plants are young, as it is almost an impossibility for the cultivator to maintain a sufficient amount of atmospheric moisture to meet their requirements; and, unless this is managed, the leaves will shrivel and fall off, leaving only a few at the extremity. Therefore, as soon as the plants are established upon the blocks of wood, let them be removed and potted. Fill the pot three parts full of broken potsherds and lumps of charcoal, and then use nothing but clean, living sphagnum, placing a few roots in the moss and leaving the others free. By this means a greater amount of moisture can be supplied to them, and thus beautiful and symmetrical specimens obtained. The Aerides are easily grown into handsome plants, which usually blossom profusely, and thus recommend themselves to all who cultivate Orchids. From early spring until the end of September they should be treated liberally with water, at the same time taking care never to wet the flowers. After the above-named time, a gradual diminution in the water supply to the roots should take place; and the atmosphere, too, should be less densely charged with moisture. But drought should never be carried far enough to cause the leaves to shrivel, for, if this is done, the uniformity of the specimen is marred; and, although we are quite willing to admit the possibility of the plants producing a greater quantity of flower spikes after a thorough shrivelling, we prefer to advocate the system that gives a fair amount of flower coupled with good leafage. As before remarked, the Aerides are peculiarly eastern, and therefore are usually classed amongst the Orchids which require the hottest houses. This is, in one sense, correct; yet they do not require the great amount of heat which many imagine, and which has, until recently, been given them. They must not, therefore, be excluded from the amateur's collection of Orchids. During the winter season many of the species may be kept in a temperature of 58deg. to 60deg.; whilst during the growing season the temperature may run up by sun heat without limit, so long as a free circulation of air and a sufficiency of moisture are secured. The following status of temperature may be observed: In spring, from 65deg. in the night, to 70deg. or 80deg. by day; in summer, from 70deg. in the night, to 80deg. or 85deg. through the day; in winter, about 60deg. night, and 65deg. day.

Aerides—*continued.*

A. affine (related).* *fl.* delicate rose, produced, in great profusion, on branching spikes, which are sometimes 2ft. in length, and continue in blossom two or three weeks; the sepals and petals equal, rounded at the apex; the lip is sharply rhomboid and three-lobed, with a short spur. *l.* light green, about 1ft. long. *h.* 3ft. A very handsome species from India, forming an excellent exhibition plant.

A. a. superbum (superb).* An improved variety, with larger and richer coloured flowers, and more compact habit.

A. Brookii (Sir A. Brooke's).* *fl.* purple and white; labellum bright purple; sepals and petals white, very fragrant. *l.* very ornamental, of a glaucous (milky green) hue. Bombay. This species, although one of the handsomest, is very rare.

A. crassifolium (thick-leaved).* This is a dwarf, densely-habited plant, with broad, thick, purple-dotted obliquely-bilobed leaves. The flowers, which are borne on long and drooping spikes, are bare—larger than those of *A. falcatum*, which they resemble in form, and have the segments tipped with rich purple or amethyst, the centre or throat of the flower being ivory-white. Compared with *A. falcatum*, the spur is here bent under at an angle, while in that plant it is straight; the side laciniæ of the lip are much broader and shorter in the present plant, and the two keels on the lip here stand close together at the base, and become divergent, whilst in *falcatum* they are distant at the base, and become convergent near the middle of the lip. This species is described as being the best in the genus. It may be grown near the glass, suspended in a basket. Burmah, 1877.

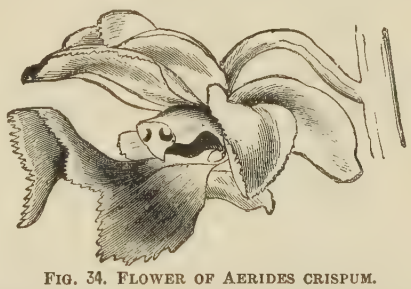


FIG. 34. FLOWER OF AERIDES CRISPUM.

A. crispum (curled).* *fl.* white, suffused with purplish rose, nearly 2in. in diameter; sepals and petals ovate, acute; lip three-lobed, the middle lobe being very large, toothed at the base, and fringed at the margin; the horn-like spur is slightly incurved; racemes ascending, more than double the length of the leaves, many-flowered. *l.* deep green, flat and broad, blunt at the ends, and two-lobed, about 4in. or 5in. long. Bombay, 1840. Lasts a long time in beauty. See Fig. 34.

A. c. Lindleyanum (Lindley's). A robust-growing variety, producing a large, much-branched panicle of flowers; sepals and petals white; lip large, bright rich rose-coloured.

A. c. Warneri (Warner's).* The leaves are smaller, and more slender than in the species; the sepals and petals are white, with a soft, rich, rose-coloured lip.

A. cylindricum (cylindric).* *fl.* white and pink, as large as those of *A. crispum*; sepals and petals crispy. *l.* elongate, subulate, terete, 4in. to 6in. long. East Indies. A very rare and distinct species. SYN. *A. vandarum.*

A. dasycarpum (thick-fruited). *fl.* brownish, rosy. India, 1865.

A. dasypogon. *See* **Sarcanthus crinaceus.**

Aerides—*continued.*

A. difforme (deformed). *fl.* green and brown. India, 1865.

A. Dominianum (Dominy's).* This is a garden hybrid between *A. Fieldingii* and *A. affine*, with the colour of the former, but markings and shape of the latter. Very rare.

A. falcatum (sickle-leaved).* *fl.* sepals and petals white, dotted with reddish crimson, and tipped with soft rose; lip white at the sides, with a rosy-crimson centre; spur short, parallel with the lip; racemes pendulous, many flowered. *l.* closely set upon the stem, peculiar blue-green, coriaceous, obtuse and mucronate. This species is very closely allied to *A. crassifolium*. SYN. *A. Larpentæ*.

FIG. 35. AERIDES ODORATUM.

A. Fieldingii (Fielding's).* The Fox-brush Ærides. *fl.* white, numerous, large, beautifully mottled with bright rose colour; the much branched racemes are 2ft. to 3ft. long, and continue flowering three or four weeks. *l.* 8in. to 10in. long, in some plants light green, and in others dark green; long, broad, thick, and fleshy, obliquely two-lobed at the apex. *h.* 3ft. to 4ft. Assam.

A. Houlletianum (Houllet's).* *fl.* sepals and petals buff, shading off into cream white at the base, with a purplish eye-spot at their tips; lip white; front part dark purplish, with some lines of the same colour on the sides; on densely crowded spikes. *l.* and growth similar to *A. virens*. Cochin China. SYN. *A. Mendelii*.

A. japonicum (Japanese).* *fl.* white, with the lateral sepals slightly barred with brown purple; several on the pendent racemes; lip purple, spotted, marked with a dark violet central ridge. *l.* short, linear-oblong, obtusely bilobed. Stems short, about 4in. high. A pretty cool house species from Japan, 1862.

A. Larpentæ (Lady Larpent's). Synonymous with *A. falcatum*.

A. Lobbii (Lobb's).* *fl.* white in the centre, slightly tinted with blush-rose towards the outside, somewhat spotted with violet; lip marked with a whitish central bar, and stained with a deep violet on either side; on long, dense, cylindrical, pendent spikes. *l.* ligulate, obliquely two-lobed at the apex, thick and fleshy in texture, about 18in. long, and of a light green hue. Moulmein, 1868. This elegant plant, of which many distinct varieties are in cultivation, is one of the most delicate of the genus.

Aerides—*continued.*

A. maculosum (spotted). *fl.* large, with obtuse pale rose-coloured sepals and petals, which are spotted with purple; lip flat and undivided, bluntly ovate, and of a deep rosy-purple; racemes pendulous, proceeding from among the upper leaves, somewhat lax and branching. *l.* ligulate, thick, and fleshy, obtuse at the apex, 8in. or 9in. long, dark green. A somewhat slow growing species, with a rather stiff, dwarf habit. Bombay, 1840.

A. m. Schrœderi (Schrœder's).* *fl.* very delicate white, tinged with lilac and spotted with rose; labellum beautiful rose coloured. *l.* dark green, 10in. long. *h.* 18in. East Indies. A very free growing and handsome variety, superior to the species, but rare in cultivation.

A. Mendelii (Mendel's). Synonymous with *A. Houlletianum*.

A. mitratum (mitred).* *fl.* waxy-white; lip violet coloured, on numerous dense erect racemes. April. *l.* cylindrical, attenuated, about 2ft. long, dark green. Moulmein, 1864. A rare but elegant species.

A. nobile (noble).* *fl.* sepals and petals white tipped, and spotted with bright rose; lip three-lobed, the side lobes creamy yellow, and the middle lobe slightly bifid at the apex, white, dotted with rose-purple, very fragrant; racemes 2ft. to 3ft. long, pendulous, much branched, many flowered. *l.* strap-shaped, obliquely emarginate at the apex, light green, slightly spotted with brown. Not unlike *A. suavissimum*, but with larger and better coloured flowers, and more robust growth. East Indies.

A. odontochilum (tooth-lipped). *h.* 2ft. Sylhet, 1837.

A. odoratum (fragrant).* *fl.* sepals and petals creamy and white, tipped with pink; lip cucullate, with even side lobes, the middle lobe being ovate and inflexed, the spur conical and incurved, of the same colour as the sepals, very fragrant; racemes longer than the leaves, many-flowered, pendulous. *l.* oblique, obtuse, mucronate at the apex, and dark green. East Indies, 1800. See Fig. 35.

A. o. cornutum (horned). *fl.* pink and white. Distinct.

A. o. majus (greater).* Like *A. odoratum* in growth, but with larger and longer spike of flowers.

A. o. purpurascens (purplish).* A very robust variety, with broad dark green leaves and massive spike of large flowers, which are white, tipped with bright pink.

A. pachyphyllum (thick-leaved). *fl.* light crimson lake; spur and column white, the small laciniæ of the blade of the lip on front part of spur painted with more or less warm purple (these laciniæ are just as insignificant as the spur is preponderant); raceme short, few-flowered. *l.* fleshy, short; apex obtuse, and unequally two-lobed. Burmah, 1880.

A. quinquevulnerum (five-wounded).* *fl.* fragrant; sepals and petals obtuse, white, marked with five reddish crimson blotches, and tipped with purple; lip cucullate and funnel-shaped, the side lobes being erect and the centre lobe oblong, incurved and serrated, of the same colour as the sepals; spur conical, green, large; racemes longer than the leaves, pendulous, and many-flowered. Late summer and early autumn. *l.* ligulate, about 12in. long, tightly clasping the stem at the base, obliquely mucronate at the apex, bright shining green. Philippines, 1838.

A. q. Farmeri (Farmer's).* A very rare variety of the above, with similar habit, but the flowers are pure white throughout, and fragrant.

A. Reichenbachii (Reichenbach's).* *fl.*, sepals neatly striped (not blotched); lip deep orange colour; racemes densely crowded. Borneo, 1858. A very rare species.

A. roseum (rose-coloured).* *fl.*, sepals and petals narrow, acute, pale rose colour, with darker spots; lip flat, entire, and acute, of a bright rose, freckled—like the sepals and petals—with spots of a darker hue; raceme pendulous, dense, and many-flowered, upwards of 1ft. in length. *l.* coriaceous, recurved, and channelled above with a blunt two-lobed apex. Moulmein, 1840. As this does not root freely, it requires less moisture than any other species.

A. r. superbum (superb).* A fine variety, with stronger growth and larger and richer-coloured flowers. The spikes of this, as well as the typical species, are apt to die off if much water is given.

A. rubrum (red). A synonym of *Sarcanthus erinaceus*.

A. suavissimum (sweetest). *fl.*, sepals and petals obtusely ovate, white, tipped or tinged throughout with deep lilac; lip three-lobed, pressed to the column, the side lobes being oblong and denticulate, the middle lobe linear and bifid, the whole lip being of a pale lemon colour, and the spur rosy-eyed; the numerous racemes are half pendulous and branched, bearing a profusion of deliciously fragrant flowers. *l.* flaccid, about 10in. long, light green, profusely freckled with brown dots. Malacca, 1848. There are one or two varieties.

A. tesselatum (chequered). *fl.* lined and streaked with green, white, and purple. East Indies, 1838. A scarce species.

A. testaceum (testaceous). A synonym of *Vanda parviflora*.

A. Thibautianum (Thibaut's). A synonym of *Saccolabium Huttoni*.

A. vandarum (Vanda). A synonym of *A. cylindricum*.

Aerides—*continued.*

A. virens (vigorous). *fl.* deliciously fragrant; sepals and petals ovate, obtuse, soft white, tipped with rosy-purple; lip large; side lobes toothed at the apex, white, dotted with crimson; middle lobe bearing a red inflated tongue; racemes long, drooping, many-flowered, commencing to blossom early in April, and lasting until July. *l.* broad, oblique, rounded at the apex, with a depression in the centre, and very bright green, about 8in. long.

A. v. Ellisii (Ellis's).* *fl.* sepals and petals large, white, suffused with rose, and tipped with amethyst; the lower sepals very round and broad; lip large; side lobes white, beautifully freckled towards the base, with short lines of amethyst; middle lobe broad, and deep rich amethyst in colour; spur stout, curved upwards, and tipped with brown; racemes about 18in. long, bearing generally from thirty to forty, or more, large flowers. *l.* pale green. A splendid variety.

A. Wightianum. *See* **Vanda testacea.**

A. Williamsii (Williams's).* *fl.* delicate pinkish white, produced in great abundance; spikes 2ft. to 3ft. long, and branched, *l.* broad, dark green, drooping. A very scarce and pretty species.

AEROBION. *See* **Angræcum.**

AEROPHYTES. Plants that are grown entirely in the air.

ÆSCHYNANTHUS (from *aischuno*, to be ashamed, and *anthos*, a flower). SYN. *Trichosporum.* ORD. *Gesneraceæ.* A genus of very beautiful twining, radicant or parasitical stove shrubs, with opposite, simple, entire leaves, and axillary, terminal, few-flowered, umbellate peduncles. They are worthy of extensive cultivation, possessing handsome flowers, fine deep green leaves, an agreeable fragrance, and are easily grown on blocks, which must be covered with green moss, fastened on with small copper wire. Preparatory to fastening them on, the roots should be covered with moss, and the plants secured to the block also by wire. After this, but little attention is requisite, except duly syringing and occasionally dipping in tepid water. As pot plants they are very beautiful, and in this method perfection is only obtained by growing them on fast and strong by generous treatment, which consists in frequently re-potting in light rich compost till they are large enough to be trained up a trellis, formed of slender rods of willow or hazel. Propagated by seeds and cuttings. The former are very unsatisfactory; the latter root readily during spring in a well-drained pot, filled with a light compost, and having a surface of pure white sand, about 1in. deep. The best are obtained from half-ripened wood, cut into 2in. or 3in. lengths, and all leaves, with the exception of one or two at the top, removed. The cuttings should then be covered over with a bell glass, and placed in moderate bottom heat. So soon as rooted, transfer them singly to small pots, and again place under hand glasses, until they are thoroughly established, then gradually harden off. When about twelve months old, place the plants in their permanent quarters. Baskets are commonly and very effectively employed. Line these with moss, and fill with a light rich compost; place the plant as near the centre as possible, and, to promote a uniform growth, fasten down the branches with small neat pegs, at equal distances. During the summer, give copious supplies of water, to produce a liberal growth, which is of the utmost importance the first season, when they should not be permitted to flower. The following winter they should be kept cool and rather dry, thus giving them a rest. The year following, if properly managed, they will blossom profusely.

Æ. atrosanguinea (dark-red).* *fl.* dark red; corolla 1½in. long, cylindrical, saccate at base, pilose; peduncle one-flowered. July. *l.* pilose, oblong, subcordate, serrated, unequal. *h.* 1½ft. Guatemala, 1848.

Æschynanthus—*continued.*

Æ. Aucklandi (Lord Auckland's). Synonymous with *Æ. speciosus.*

Æ. Boschianus (Bosch's).* *fl.* scarlet, axillary, clustered; corolla tubular, with wide throat; calyx tubular, smooth, purplish-brown. July. *l.* ovate, obtuse, entire. *h.* 1ft. Java, 1844. See Fig. 36.

Æ. cordifolius (heart-leaved).* *fl.* deep red, striped with black, inside of the tube orange, axillary, clustered. Summer. *l.* cordate, quite smooth, dark green on the upper side, paler below. *h.* 1ft. Borneo, 1858.

Æ. fulgens (shining).* *fl.* bright crimson, very long; throat and the under side of the tube orange; lobes striped with black, disposed in terminal umbels. October. *l.* large, oblong-lanceolate, acuminate, thick and fleshy, bright dark green. *h.* 1ft. East Indies, 1855.

Æ. grandiflorus (large-flowered).* *fl.* deep crimson and orange, large; corolla clavate; segments obtuse, with a dark mark at top, equal; umbels many-flowered. August. *l.* oblong-lanceolate, acuminated, serrated, obscurely-nerved, fleshy, dark green, *h.* 5ft. East Indies, 1838.

Æ. javanicus (Java). *fl.* bright red, stained with yellow in the throat; corolla downy, tubular; corymbs terminal, bracteate. June. *l.* small, ovate, slightly toothed, with sunk veins. Java, 1848. Plant scandent.

Æ. Lobbianus (Lobb's).* *fl.* rich scarlet; calyx large, campanulate; corolla downy; corymbs terminal, bracteate. June. *l.* elliptic, entire or slightly serrated, glaucous. Java, 1846. Plant subscandent.

FIG. 36. ÆSCHYNANTHUS BOSCHIANUS.

Æ. longiflorus (long-flowered).* *fl.* scarlet, erect, fascicled; corolla with a long clavate curved tube, and oblique constructed bilobed mouth; upper lobe bifid. Summer. *l.* broad-lanceolate, acuminate, entire. Java, 1845. Plant pendulous.

Æ. miniatus (vermilion).* *fl.* rich vermilion; corolla tomentose; upper lip bilobed, lower one tripartite; peduncles axillary, three-flowered. June. *l.* oval acute, entire. *h.* 1½ft. Java, 1845. SYN. *Æ. radicans.*

Æ. pulcher (fair).* *fl.* bright scarlet; corolla three times larger than the calyx; corymbs terminal, bracteate. June. *l.* ovate, obscurely toothed. Java, 1845. Scandent.

Æ. radicans (rooting). Synonymous with *Æ. miniatus.*

Æ. speciosus (showy).* *fl.* rich orange-coloured; corolla with long clavate curved tube, and obliquely four-lobed limb; upper lobe bifid, terminal, numerous, downy. Summer. *l.* upper ones always verticillate, ovate-lanceolate, acuminate, slightly serrate. *h.* 2ft. Java, 1845. SYN. *Æ. Aucklandi.*

Æ. splendidus (splendid).* *fl.* bright scarlet, spotted with black on the margins; corolla clavate, 3in. long, in terminal fascicles. Summer, lasting in perfection for a considerable time. *l.* elliptic lanceolate, acuminated, entire, rather undulated. *h.* 1ft. Hybrid.

Æ. tricolor (three-coloured).* *fl.* deep blood red, usually twin; throat and base of the lobes bright orange, the three upper lobes being striped with black. July. *l.* cordate, dark green above, paler on the under side; edges, under surface, and stem, slightly hairy. *h.* 1ft. Borneo, 1857.

Æ. zebrinus (zebra-marked). *fl.* green, brown. Autumn. Java, 1846.

ÆSCHYNOMENE (from *aischuno*, to be ashamed; in reference to the leaves of some of the species falling on the slightest touch, like those of the Sensitive plant).

Æschynomene—*continued.*

ORD. *Leguminosæ*. Stove herbs and shrubs, with imparipinnate leaves, having many pairs of leaflets, and axillary racemes of usually yellow flowers. They thrive well in a good rich loam. Propagated by cuttings, placed in sand under a bell glass, in a brisk heat. Seeds of the herbaceous species require a good heat to start them into growth. The annuals are not worth growing. There are about forty other species known besides those mentioned, some of which may prove worthy of cultivation when introduced.

Æ. aristata (awned). A synonym of *Pictatia aristata*.

Æ. aspera (rough-stemmed). *fl.* yellow; racemes compound; peduncles, bracteas, calyces, and corollas, hispid. June. *l.* with thirty to forty pairs of linear leaflets, which (as well as the legumes) are smooth. Stem herbaceous, erect. *h.* 6ft. to 8ft. East Indies, 1759. Perennial.

Æ. sensitiva (sensitive).* *fl.* white; legumes and racemes glabrous; peduncles branched, few-flowered. June. *l.* with sixteen to twenty pairs of linear leaflets. Stem smooth. *h.* 3ft. to 6ft. Jamaica, 1733. This shrub requires a sandy soil.

ÆSCULUS (a name given by Pliny to a kind of oak having an edible fruit; derived from *esca*, nourishment). The Horse Chestnut. ORD. *Sapindaceæ*. A genus of hardy showy trees, well adapted for lawns or parks, having a beautiful appearance when in flower. They will do well in any soil, but the more loamy the better. Increased by layers, put down in the spring, or by grafting or budding on the common horse chestnut. Seeds, where procurable, should be sown singly in rows in spring, where they may remain until they are of sufficient size to be permanently planted out. This genus is distinguished from *Pavia*, in having its capsules echinated, *i.e.*, covered with prickles, like a hedgehog; but this character is not always consistent.

Æ. carnea (flesh-coloured). Synonymous with *Æ. rubicunda*.

Æ. glabra (smooth-leaved).* *fl.* greenish yellow; corolla of four spreading petals, with their claws about the length of the calyx; stamens longer than the corolla. June. *l.* with five leaflets, very smooth; foliage larger than the common species. *h.* 20ft. North America, 1821. SYNS. *A. ohioensis*, *A. pallida*.

Æ. Hippocastanum (Common Horse-Chestnut). *fl.* white, tinged with red, on very handsome terminal racemes, which are produced in great profusion; petals five. April and May. *l.* with seven obovately-cuneated, acute, toothed leaflets. Asia, 1629. This, the common horse chestnut, is well known by the beautiful parabolic form in which it grows, and during the period of its flowering no tree possesses greater beauty. It has two or three unimportant varieties, differing in the variation of their leaves, and one also with double flowers. These are increased by grafting only.

Æ. ohioensis (Ohio). A synonym of *A. glabra*.

Æ. pallida (pale-flowered). A synonym of *A. glabra*.

Æ. rubicunda (red-flowered).* *fl.* scarlet, in very fine terminal racemes; petals four, having the claws shorter than the calyx; stamens eight. June. *l.* with five to seven obovately-cuneated, acute, unequally serrated leaflets. *h.* 20ft. North America, 1820. This is a very distinct and beautiful tree when in flower, and does not attain so large a size as *Æ. Hippocastanum*. SYN. *Æ. carnea*.

ÆSTIVATION. The manner of the folding of the calyx and corolla in the flower bud.

ÆTHIONEMA (from *aitho*, to scorch, and *nema*, a filament; apparently in allusion to some tawny or burnt appearance in the stamens). ORD. *Cruciferæ*. A genus of elegant little plants, distinguished from allied genera in having the four larger stamens winged, and with a tooth. Herbs or sub-shrubs, perennial or annual, branched from the base, diffuse or erect. Flowers in crowded terminal racemes. Leaves fleshy, sessile. They are well worth cultivating in sunny situations, where they form a freer flowering habit than when growing in a wild state. Some of the more hardy species may be planted on rock work, which, by their dwarf growth, they are well adapted for. The annual and biennial species may either be sown on rockwork or in the front of the flower-border. A light dry soil suits them best. The shrubby kinds of this genus should be kept in pots, which should be well drained with potsherds, and treated like other alpine plants. Propagated by seeds, sown in May; or by cuttings, planted in summer.

Æthionema—*continued.*

Æ. Buxbaumii (Bauxbaum's). *fl.* pale red; racemes crowded, aggregate. June. *l.* oblong-spathulate, glaucous. *h.* 6in. Thrace, 1823. A pretty annual, with erect branched stems. SYN. *Thlaspi arabicum*.

FIG. 37. ÆTHIONEMA CORIDIFOLIUM, showing Habit and Flowers.

Æ. coridifolium (Coris-leaved).* *fl.* rosy lilac, small, in terminal dense rounded racemes. June. *l.* linear, glaucous, crowded. Asia Minor, 1871. A pretty perennial, shrubby below, with erect stems 6in. to 8in. high. See Fig. 37.

Æ. gracile (slender). *fl.* purplish; racemes crowded, terminal; when in fruit, loose. June. *l.* lanceolate, pointed. *h.* 8in. Branches and branchlets slender, elongated. Sandy hills in Carniola, 1820. Shrubby perennial.

FIG. 38. ÆTHIONEMA GRANDIFLORUM, showing Habit and Flowers.

Æ. grandiflorum (large-flowered).* *fl.* of a warm shaded rose; racemes crowded, terminal, numerous. May to August. *l.* ovate-oblong, glaucous. Mount Lebanon, 1879. This perennial species forms a spreading bush about 1½ft. high, and is perhaps the handsomest of the genus. It succeeds well in the ordinary border, but is far better suited for the rockery. See Fig. 38.

Æ. membranaceum (membranous-podded). *fl.* purplish, in terminal racemes. June. *l.* linear, distant, somewhat fleshy, strictly appressed. *h.* 3in. to 6in. Persia, 1828. A small shrub, with filiform branches.

Æ. monospermum (one-seeded). *fl.* purple, largish, in terminal racemes. July. *l.* oval or obovate, blunt, coriaceous; pods one-celled, one-seeded. *h.* 3in. to 6in. Spain, 1778. A pretty little biennial, with hardish branches.

Æ. pulchellum (pretty).* This is said to be a new species, but it much resembles *Æ. coridifolium*. It is scarcely in full cultivation yet, but it proves one of the hardiest as well as one of the most handsome kinds.

Æ. saxatilis (rock).* *fl.* purplish; racemes loose, terminal. May and June. *l.* lanceolate, acutish. *h.* 8in. Spain, 1820. A pretty annual.

AFRICAN ALMOND. *See* **Brabejum.**

AFRICAN BLADDER NUT. *See* **Royena lucida.**

AFRICAN FLEABANE. *See* **Tarchonanthus.**

AFRICAN HAREBELL. *See* **Roella ciliata.**

AFRICAN LILY. *See* **Agapanthus.**

AFRICAN LOTUS. *See* **Zizyphus Lotus.**

AFRICAN MARIGOLD. *See* **Tagetes erecta.**

AFRICAN OAK. *See* **Oldfieldia africana.**

AFRICAN SATIN-BUSH. *See* **Podalyria sericea.**

AFZELIA (named after Adam Afzelius, M.D., Professor of Botany in the University of Upsal, and for many years resident at Sierra Leone). ORD. *Leguminosæ*. A pretty stove evergreen tree. For culture, *see* **Ægiphila.**

A. africana (African).* *fl.* crimson, disposed in racemes; petals four (furnished with claws), upper one largest. June. *fr.*, legume ligneus, many-celled; seeds black, with scarlet aril. *l.* abruptly pinnate. *h.* 30ft. Sierra Leone, 1821.

AFZELIA (of Gmelin). A synonym of **Seymeria** (which *see*).

AGALMYLA (from *agalma*, an ornament, and *hule*, a wood; the species ornament the woods in which they grow wild). ORD. *Gesneraceæ*. A small genus of handsome, climbing or radicant herbs. Flowers in axillary fascicles; corolla limb oblique, five-lobed, scarcely two-lipped. Leaves simple, alternate. *A. staminea*, the most generally cultivated species, is best grown in a basket, planted in a compost of rough peat, a little leaf soil, fresh sphagnum moss, and nodules of charcoal. Give an abundance of moisture when growing, which should be lessened after flowering, and allow the plant to rest during winter. It may be planted out on rockwork in the stove. The temperature in summer should not be less than 75deg. by day, and 65deg. by night. Half-ripened cuttings will root freely in heat under a glass.

A. longistyla (long-styled). *fl.* crimson. Java, 1873.

A. staminea (long-stamened).* *fl.* scarlet, disposed in axillary fascicles; corolla tubular, incurved, with a dilated throat. Summer. *l.* alternate, oblong, acuminated, denticulated, nearly equal at the base, downy beneath, and on the edges. Stem and petioles hairy. *h.* 2ft. Java, 1846. Stove species.

AGANISIA (from *aganos*, desirable; in reference to the beauty of these neat little plants). ORD. *Orchideæ*. A small genus of epiphytal Orchids, requiring to be grown upon a block of wood suspended from the rafters of the stove. A damp atmosphere, syringing the roots and leaves freely when in a growing state, and shade during very bright sunshine, are primary points to be observed in their cultivation. Increased by dividing the pseudo-bulbs just previous to starting into new growth.

A. cœrulea (dark blue).* *fl.*, peduncles axillary, few flowered. "The colour is the well known one of *Vanda cœrulea*. There are, however, darker blue blotches quasi-tesselated over the flower. The lip is veiled, and has two very small basilar teeth, and then a veiled middle lacinia, that is sacciform, bordered with most remarkable long bristles, and with a deep violet blotch on its middle part beneath. The white column has two cartilaginous quadrate arms close to the stigmatic hollow." *l.* cuneate, oblong, acuminate. Pseudo-bulbs distichous, depresso-ovoid. Brazil, 1876.

A. fimbriata (fringed).* *fl.* white; lip blue. Demerara, 1874. This species has also a sacciform, fimbriate lip, but, when compared with the foregoing, its flowers, leaves, and bulbs are much smaller, and the lip is not slit up to the apex, but the sac is round.

A. graminea (grass-leaved). A weedy looking species, of no garden value. Guiana, 1836.

A. ionoptera (violet-winged). The flowers, not very much larger than those of the Lily of the Valley, are white, with violet petals, and violet tips and streaks on the sepals. Peru, 1871.

A. pulchella (pretty).* *fl.* white, with a blotch of yellow in the centre of the lip; the spike is produced from the bottom of the bulb. *h.* 8in. Demerara, 1838. It blossoms at different times of the year, and lasts two or three weeks in perfection. This species is very rare and pretty, and is best grown in a pot, with peat, and good drainage; requires a liberal supply of water at the roots, and the hottest house.

AGANOSMA (from *aganos*, mild, and *osme*, a smell; scent of flowers). ORD. *Apocynaceæ*. A genus of showy stove or warm greenhouse shrubs, with opposite leaves and terminal corymbs of large funnel-shaped flowers, the coronet of which is cup-shaped or cylindrical, "having its parts so united that they appear only as lobes around the mouth of the cup." All the species mentioned are well worth cultivating. They thrive best in a mixture of loam, sand, and peat, in equal proportions. Propagated by cuttings in sand, under glass, and with bottom heat.

Aganosma—*continued.*

A. acuminata (pointed-leaved).* *fl.* large, white, fragrant; petals linear, falcate, curled; panicles axillary, longer than the leaves, scattered. *l.* from oblong to broad-lanceolate, acuminated glabrous. Sylhet. Shrubby climber.

A. caryophyllata (Clove-scented).* *fl.* pale yellow, tinged with red, deliciously clove scented; corymbs terminal. October. *l.* oval, acutish at both ends, tomentose beneath as well as the branches. India, 1812. Shrubby twiner.

A. cymosa (cymose-flowered).* *fl.* small, whitish, fragrant; calyx and corolla hoary outside; cymes terminal, shorter than the leaves. *l.* elliptic, acuminated. Sylhet. Shrub.

A. elegans (elegant).* *fl.* small, purple; corolla downy outside, as well as the calyces, bracteas, and pedicels; sepals longer than the tube of the corolla; corymbs terminal, crowded. *l.* elliptic, short-acuminated, glabrous. India. Shrubby twiner.

A. marginata (bordered).* *fl.* numerous, large, white, fragrant; petals linear, falcate; panicles terminal, loose, corymbose, glabrous. *l.* lanceolate, smooth. Sylhet. Shrubby climber.

A. Roxburghii (Roxburgh's).* *fl.* pure white, large, fragrant; calyx and corolla hoary outside; petals triangular; corymbs terminal. October. *l.* ovate-cordate, acuminated; petioles and veins red, glabrous, pale beneath, and shining above. India, 1812. Shrubby twiner.

A. Wallichii (Wallich's).* *fl.* white, fragrant; calyx and corolla downy outside; corymbs terminal. *l.* elliptic-acuminated, shining above and pale beneath, glabrous. India. This species differs from the last in the veins of the leaves being parallel, not longitudinal, from the base to the apex. Shrubby twiner.

AGAPANTHUS (from *agape*, love, and *anthos*, a flower). ORD. *Liliaceæ*. African Lily. A genus, with numerous varieties, of very handsome greenhouse or conservatory herbaceous plants. Flowers large, scapose; perianth tubular, tube short; stamens six, having the filaments somewhat declinate. Leaves linear or lorate, arching, radical. They are of easy culture, and thrive best in strong turfy loam, leaf mould, decomposed manure, and river sand. They may be grown in large pots or tubs outside, to be removed in autumn, and placed under the stage in the greenhouse, or where they will be protected from frost, and kept moderately dry. If planted and left outside, the crowns should be well covered with cocoa-nut fibre in winter. During the summer, and especially in dry weather, the plants can hardly be over watered. They thrive admirably on the margins of lakes or running streams, and few plants, alike in flower and foliage, are more effective. Clear manure water may be given previous to or when the plants are in flower, and, after flowering, gradually lessen the quantity of water, until they are stowed away for the winter. They increase very rapidly, by offsets, and, if necessary, the old plants may be divided in early spring, to any extent required. In the more southern parts of this country they are quite hardy.

FIG. 39. AGAPANTHUS UMBELLATUS.

A. umbellatus (umbelled).* *fl.* bright blue; perianth funnel-shaped, regular, deeply six-parted; tube short; scape tall, naked, bearing a many-flowered umbel. Summer and autumn. *l.* numerous, radical, linear, somewhat fleshy. *h.* 2ft. to 3ft. Cape of Good Hope, 1692. See Fig. 39.

Agapanthus—*continued.*

A. u. albidus (whitish).* *fl.* pure white, on large full-sized umbels, smaller than those of the species, but very showy. Cape of Good Hope. This requires carefully drying off during the winter.

A. u. aureus (golden). A variety in which the leaves are marked longitudinally with yellow. 1882.

A. u. flore-pleno (double-flowered).* Identical in all respects with the species, except that it has double flowers, which are therefore, much more lasting than the single ones. A very handsome variety.

A. u. Leichtlinii (Leichtlin's).* *fl.*, perianth deep bright hyacinthine blue, 1¼in. long; scape about 1½ft. long, with a more compact umbel than any other known form. June. *l.* similar in size to the species. Cape of Good Hope, 1878.

A. u. maximus (larger).* *fl.* bright blue, in immense umbels. This is larger in all its parts than the type, and when well grown is truly a noble plant. There is also a white-flowered form of this variety, which is most desirable, being equally as large.

A. u. minor (smaller).* This is smaller in all its parts, with narrow leaves, and slender scapes of deep blue flowers. A very elegant variety.

A. u. Mooreanus (Moore's).* *fl.* dark blue. *h.* 1½ft. 1879. A new variety, with shorter, narrower, and more upright leaves than the species; it has a dwarf habit. Perfectly hardy.

A. u. variegatus (variegated).* Where variegated-leaved plants are desired, few could be more useful than this; its leaves are almost entirely white, with a few green bands, but they are neither so broad nor so long as in the type. It is an excellent subject for the domestic garden.

AGAPETES (from *agapetos*, beloved; in reference to the showy character of the plants). ORD. *Vacciniaceæ*. A genus containing about eighteen species of warm greenhouse or stove evergreen shrubs. Flowers corymbose and racemose; corolla tubular. Leaves alternate, coriaceous. They are all worthy of cultivation, but only two or three species are grown in England. Peat, turfy loam, and sand, in equal parts, is the best compost for them; and young hardened cuttings will strike in sandy soil, under a hand glass, in stove temperature.

A. buxifolia (Box-leaved).* *fl.* bright red, about 1in. long, tubular, wax-like, disposed in corymbs. April. *l.* small, oval oblong, bright green, leathery; branches spreading, twiggy. *h.* 5ft. Bootan.

A. setigera (bristly). *fl.* red, about 1in. long, tubular, numerous, in lateral and corymbose racemes, furnished with bristly hairs. *l.* scattered, lanceolate, acuminated, on very short robust petioles. Pundua Mountains, 1837.

A. variegata (variegated). *fl.* scarlet, about 1in. long, tubular, lateral, corymbose. *l.* on short petioles, lanceolate, acuminated, denticulated, attenuated at the base, veiny. Khasia, 1837.

AGARICUS (derived from *Agaria*, the name of a town in Sarmentosa). Mushroom. ORD. *Fungi*. The most extensive genus known. It, however, contains but one or two species of cultural value. The most important ones are the common field mushroom, *A. campestris* (Fig. 44), the Fairy Ring mushroom, *A. pratensis*, and *A. vaginatus*. Familiar species are the Parasol mushroom, *A. procerus* (Fig. 43); St. George's mushroom, *A. gambosus* (Fig. 42); and the deadly Fly Agaric, *A. muscarius* (Fig. 41). For practical purposes the majority of this genus are poisonous, and many virulently so. Great care must be exercised in experimenting with unknown species, even by experienced fungologists. *See* **Mushroom.**

AGASTACHYS (from *agastos*, admirable, and *stachys*, a spike). ORD. *Proteaceæ*. A greenhouse evergreen shrub, with four sepalled apetalous flowers, which are disposed in numerous spikes. It thrives in a compost of equal parts loam, sand, and peat. Cuttings of ripened wood will strike in sandy soil under a glass, in a cool house.

A. odorata (fragrant).* *fl.* pale yellow, sweet scented, crowded; spikes 4in. to 5in. long. April. *l.* bluntly lanceolate, sub-sessile, thickish, about 2in. long. *h.* about 3ft. New Holland, 1826.

AGATHÆA (from *agathos*, excellent; in reference to the beauty of the flowers). ORD. *Compositæ*. Allied to *Cineraria*, and requiring the same greenhouse treatment. It makes a very pretty object for summer decoration in the flower garden. Young cuttings root freely, in a gentle heat, at all times; and the plant may be had in flower all the year round.

Agathæa—*continued.*

A. cœlestis (sky-blue).* *fl.-heads* blue; peduncle one-headed. June. *l.* opposite, ovate, naked. *h.* 1½ft. Cape of Good Hope, 1753. Herbaceous perennial. See Fig. 40.

FIG. 40. AGATHÆA CŒLESTIS.

AGATHA ROSE. *See* **Rosa gallica Agatha.**

AGATHIS. *See* **Dammara.**

AGATHOPHYLLUM (from *agathos*, pleasant, and *phyllon*, a leaf; referring to the pleasant clove-like smell of the leaf). Madagascar Nutmeg. ORD. *Laurineæ*. A stove evergreen tree, of economic value only, having the fruit enclosed by the persistent calyx; thriving in peat and light rich loam. Of easy propagation by cuttings in sand, with a moderate bottom heat.

A. aromaticum (aromatic). *fl.* white. *l.* stalked, alternate, obovate, obtuse, leathery, entire, smooth. *h.* 30ft. Madagascar, 1823.

AGATHOSMA (from *agathos*, pleasant, and *osme*, smell; the plants contained in this genus have a pleasant smell). SYNS. *Bucco*, *Dichosma*. ORD. *Rutaceæ*. Beautiful small Heath-like greenhouse shrubs, from the Cape of Good Hope. Flowers in terminal heads, or umbels; petals five, divided, with long claws, and scattered, short, narrow leaves, usually with revolute edges. They are of easy culture, thriving best in a mixture of sand and peat, with the addition of a little turfy loam. Young cuttings will strike root freely in a pot of sand, under a bell glass, in a cool house. They require to be shaded somewhat in the summer. Winter temperature, 40deg. to 45deg. About forty-six species are known.

A. acuminata (taper-pointed leaved).* *fl.* violet; calyces smooth, glandular, on terminal subcapitate heads. April. *l.* ovate, somewhat cordate, long acuminated, fringed, at length spreading. *h.* 1ft. to 2ft. 1812.

A. bruniades (Brunia-like).* *fl.* lilac or white, on terminal sub-umbellate heads; peduncles fastigiate, elongated. April. *l.* scattered, linear-trigonal, awl-shaped, dotted, and a little fringed; branches hairy. *h.* 1ft. to 2ft. 1820.

A. cerefolia (Chervil-leaved). *fl.* white, small; pedicels and calyces beset with glandular hairs; heads terminal sub-umbellate. April. *l.* crowded, lanceolate, acute, spreading, keeled, fringed. *h.* 1ft. to 2ft. 1794.

A. ciliata (ciliated).* *fl.* white; pedicels smoothish; heads terminal sub-umbellate. April. *l.* scattered, lanceolate, acute, with toothletted-fringed, revolute edges, dotted beneath, and bearing hairs on the middle nerve, becoming at length reflexed. *h.* 1ft. to 2ft. 1774.

A. erecta (upright).* *fl.* pale violet, terminal, sub-umbellate; peduncles short, villous. April. *l.* imbricate, trigonal, blunt, dotted beneath, a little fringed. *h.* 1ft. to 2ft. 1818.

A. hirta (hairy). *fl.* purple, densely capitate; petals bearded at the claws. April. *l.* somewhat imbricate, linear, awl-shaped, channelled, hairy on the back, decurrent. *h.* 1ft. to 2ft. 1794.

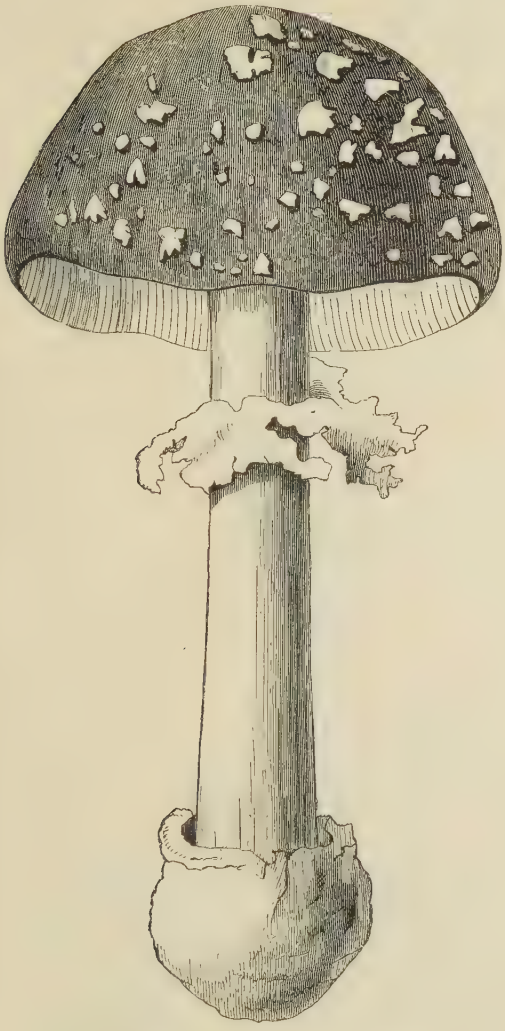


FIG. 41. AGARICUS MUSCARIUS (FLY AGARIC).

FIG. 43. AGARICUS PROCERUS (PARASOL MUSHROOM).

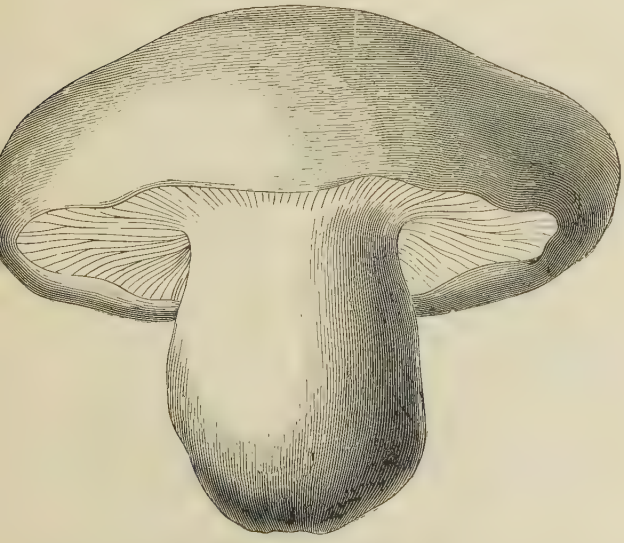


FIG. 42. AGARICUS GAMBOSUS (ST. GEORGE'S MUSHROOM).

FIG. 44. AGARICUS CAMPESTRIS COMMON MUSHROOM).

Agathosma—*continued.*

A. hispida (rough-haired). *fl.* violet, on terminal sub-umbellate heads; pedicels and sepals pubescent; petals quite smooth. May. *l.* crowded, linear, trigonal, blunt, spreading, hispid, keeled, and two-furrowed beneath. *h.* 1ft. to 2ft. 1786.

A. imbricata (imbricated). *fl.* pale purple, in terminal sub-capitate heads; petals with a roundish limb; sepals smoothish; pedicels pubescent. April. *l.* imbricate, crowded, ovate, acuminated, dotted, fringed. *h.* 1ft. to 2ft. 1774.

A. orbicularis (round-leaved). *fl.* white, on terminal sub-umbellate heads; stamens twice as long as the corolla; pedicels pubescent. April. *l.* scattered, spreading, orbicular, ovate, or reniform, smooth, reflexed, small, thickish, without any dots beneath; branches villous. *h.* 1ft. to 2ft. 1790.

A. prolifera (proliferous). *fl.* white, on terminal sub-umbellate heads; sepals smooth; pedicels somewhat fastigiate, pubescent. April. *l.* spreading, lanceolate, cuspidate; keel and edges fringed, dotted; branches whorled, proliferous. *h.* 1ft. to 3ft. 1790.

A. pubescens (downy). *fl.* white; umbels terminal; peduncles and sepals villous. April. *l.* lanceolate, trigonal, pointless, with margins and rib ciliated. *h.* 1ft. to 2ft. 1798.

A. rugosa (coarsely-wrinkled). *fl.* white, on terminal sub-umbellate heads; sepals pubescent; pedicels capillary, clothed with glandular hairs. April. *l.* spreading, oblong or ovate, blunt, keeled, wrinkled, villous beneath, reflexed. *h.* 1ft. to 2ft. 1790.

A. vestita (clothed). *fl.* lilac, on terminal sub-capitate heads; pedicels quite smooth. May. *l.* closely imbricated, ovate, acuminated, keeled, fringed. *h.* 1ft. to 2ft. 1824.

AGATHYRSUS. *See* **Mulgedium.**

AGATI (its Sanscrit name). ORD. *Leguminosæ.* Ornamental stove trees from India, with lanceolate stipulas, abruptly-pinnate leaves, having many pairs of leaflets. Flowers large, few, racemose. Legumes 1½ft. long. A mixture of loam, peat, and sand is most suitable. Young cuttings will root in a pot of sand, with a hand glass over them, placed in heat.

A. coccinea (scarlet).* *fl.* red, rather smaller than the next species. Legumes rather terete. *l.* leaflets powdery. July. *h.* 20ft. to 30ft. 1768.

A. grandiflora (large-flowered). *fl.* rosy red. July. Legumes evidently compressed. *l.* leaflets glabrous. *h.* 14ft. to 26ft. 1768.

A. g. flore-albo (white flowered). *fl.* white, double. N. Australia, 1869.

AGAVE (from *agauos*, admirable; referring to the stately form in which some of them flower). ORD. *Amaryllideæ.* Flower-scape tall, proceeding from the centre of the rosette of leaves; perianth funnel-shaped, six-parted. Leaves large, fleshy, tufted. Mr. B. S. Williams describes them as follows: "They are noble, massive-growing plants, and form magnificent ornaments in the greenhouse or conservatory; whilst, from their slow growth, they do not rapidly get too large, even for a small greenhouse. Indeed, some of the real gems of this genus are neat, compact-growing plants, seldom exceeding 2ft. in height. Besides being fine ornamental plants for indoor decoration, the larger growing kinds are unquestionably the finest objects for the embellishment of terrace-walks, or surmounting flights of steps in the open air during the summer season, and also for plunging in rockwork, or about any rustic nooks in the pleasure-grounds, as, in such situations, they are quite in keeping, and thrive admirably. As is well known, they attain maturity very slowly; but when this condition is reached, the plant sends up a flower spike, and, after perfecting this, dies." *A. Sartorii*, and a few others are, however, exceptional, and go on flowering year after year. It is certainly fallacious to suppose it takes them a hundred years to flower. Agaves succeed well potted in good loam and river sand, to which may be added a little peat and leaf mould for some of the smaller-growing kinds. The drainage should be good, as they enjoy a liberal supply of water during the summer season, but during winter considerably less will be required. They can be increased by suckers when these are to be obtained, and also by seeds, to secure the production of which, in the species that do not yield suckers, the flowers should be carefully impregnated. In the following descriptive list of species, only those of horticultural value are mentioned, some of which are still rare; and in describing them we have availed ourselves of Mr. J. G. Baker's excellent monograph, which appeared in the columns of the *Gardeners' Chronicle.* Many are omitted, not from any deficiency in horticultural beauty, but because, in several instances, only one plant of a species is known to exist in cultivation, and such cannot, therefore, hope to become in general cultivation for many years hence.

Agave—*continued.*

A. albicans (whitened). Probably a variety of *A. micrantha.*

FIG. 45. AGAVE AMERICANA.

A. americana (American).* *fl.* yellowish-green, 2in. to 3½in. long, in very dense globose clusters, on pedicels ½in. to ¾in. long; scape, including the thyrsoid panicle, 24ft. to 36ft. high. August. *l.* usually thirty to forty, sometimes more, in a rosette, oblanceolate-spathulate, 3ft. to 6ft. long, 6in. to 9in. broad above the middle, glaucous green, more or less concave all down the face, the outer leaves recurved, the dark brown pungent point 1in. to 2in. long; prickles brown-tipped, ½in. to ¾in. long. South America, 1640. See Fig. 45.

A. a. mexicana (Mexican). A variety much shorter in the leaves than the species, of which it may be regarded as one of the many small forms.

A. a. picta (painted).* *l.* 2ft. to 3ft. long, about 4in. wide, lower ones recurved, upper ones erect, moderately thick, rich golden yellow on both sides, bordered with dark green. A very splendid variety. SYN. *A. ornata.*

A. a. variegata (variegated). *l.* 6ft. or more in length, 6in. or 8in. wide, dark green in the centre, broadly margined with rich yellow. A very desirable variety.

A. amœna (pleasing). Referred to *A. Scolymus.*

A. amurensis (Amur River). Synonymous with *A. xylacantha.*

A. applanata (plano-convex-leaved). *fl.* unknown. *l.* twenty to forty in a dense sessile rosette, reaching a couple of feet in diameter, oblong-spathulate, 8in. to 12in. long, 2in. to 3½in. broad, the lower half of the face flat, the upper half concave, suddenly terminating in a pungent brown spine above 1in. long, blue-green bordered with brown; prickles ½in. to ¾in. long, bright brown. Mexico, 1869.

Agave—*continued.*

A. atrovirens (dark-green). Synonymous with *A. Salmiana.*

A. attenuata (attenuated).* *fl.* greenish-yellow, 2in. long; pedicels about ¼in. long, on a dense spike, 6ft. to 8ft. long, and 6in. in diameter; bracts overtopping the perianth. *l.* ten to twenty, in a dense rosette at the top of the stem, oblong-spathulate, 2ft. to 2½ft. long, 8in. to 9in. broad two-thirds of the way up, narrowed to 2½in. to 3in. above the base, persistently glaucous, one of the most fleshy of all in texture; face rather concave when young; tip not pungent, edge quite entire. Stem 4ft. to 7ft. high, 3in. to 4in. thick. Mexico, 1834. A most distinct species.

A. Beaucarnei (Beaucarne's). Synonymous with *A. Kerchovei.*

A. Botteri (Botteri's).* *fl.* greenish-yellow, about 1in. long, on a dense spike, longer than the leaves; primary bracts lanceolate, with a long point, the lower ones as long as the flowers; scape covered with adpressed lanceolate bracts. *l.* about fifty in a rosette, oblong-spathulate, about 2ft. long, 6in. broad above the middle, narrowed to 4½in. above the base; pale green, concave in the centre; spine hard, pungent, about ½in. long; marginal teeth crowded, ⅛in., upcurved at the tip. Stemless. Mexico, about 1865.

A. bulbifera (bulb-bearing). Synonymous with *A. vivipara.*

A. cæspitosa (tufted). Synonymous with *A. Sartorii.*

A. cantula. Synonymous with *A. vivipara.*

FIG. 46. AGAVE CELSIANA.

A. Celsiana (Celsius').* *fl.* tinged purplish-brown, 2in. long, in a dense spike, 1ft. or more long, and 6in. to 8in. in diameter when expanded; scape 4ft. long, the lower bract leaves lanceolate, the upper ones subulate. *l.* twenty to thirty in a rosette, oblong-spathulate, 1½ft. to 2ft. long, 4in. to 5in. broad at the middle, narrowed to 2½in. to 3in. above the base, persistently glaucous, the point hardly at all pungent; spines very unequal in size and shape, green, largest brown and horny at the top. Mexico, 1839. This is a beautiful species, the stem of which scarcely rises off the surface of the ground. See Fig. 46.

A. coccinea (scarlet). *fl.* unknown. *l.* twenty to thirty in a dense rosette, oblanceolate-spathulate, 1½ft. to 2ft. long, 4in. to 6in. broad two-thirds of the way up, narrowed to 3in. above the

Agave—*continued.*

dilated base, where it is 1in. to 1¼in. thick, deep heavy green; terminal spine 1½in. or more in length, red; side prickles irregular, deltoid, unequal, nearly straight. ⅛in. to ½in. long, red. Mexico, 1859.

A. cochlearis (cochleate). *fl.* yellowish green, above 4in. long, in dense clusters. *l.* forming a sessile rosette 10ft. broad, oblong-spathulate, 5ft. to 6ft. long, above 1ft. broad, 5in. thick at the base, opaque green, with a deeply excavated face; terminal spine very stout, pungent; side prickles curved variously, middle sized, deltoid. Stems 26ft. high. Mexico, previous to 1867.

A. Considerantı (Considerant's). Synonymous with *A. Victoriæ Regina.*

A. Corderoyi (Corderoy's).* *fl.* unknown. *l.* forty to fifty in a dense rosette, rigidly erecto-patent, ensiform, 1½ft. long, ⅜in. to 1in. broad, bright green; terminal spine hard, brown, 1in. long; side prickles moderately close, erecto-patent, dark brown, ⅛in. long. Mexico, 1868. A very distinct and pretty species.

A. crenata (crenated). Referred to *A. Scolymus.*

A. cucullata (hooded). Referred to *A. Scolymus.*

A. dasylirioides (Dasylirion-like).* *fl.* yellow, about 1½in. long; spike as long as the scape, often decurved; lower bracts much longer than the flowers; pedicels obsolete; scape 6ft. long, densely clothed with spreading subulate bract leaves, the lower ones 1ft. long. *l.* eighty to a hundred in a dense rosette, linear-ensiform, 1½ft. to 3ft. long, about 1in. broad, narrowing gradually from the middle to a short brown pungent point, pale glaucous green, rigidly leathery; edge minutely denticulate. Mexico, 1846.

A. d. dealbata (whitened). A variety of preceding, but with more glaucous foliage.

FIG. 47. AGAVE DENSIFLORA.

A. densiflora (close-flowered).* *fl.* yellowish-red, 1½in. to 2in. long, on a dense spike, 2ft. long; pedicels very short; scape, including the spike, 6ft. long, the lower bracts ascending, the upper ones spreading. *l.* thirty to forty in a stemless rosette, oblanceolate-spathulate, 2ft. to 3ft. long, and 2½in. to 5in. broad, bright green when mature; terminal spine ½in. long, thick, pungent, slightly decurrent; side spines crowded, short, bright chestnut brown. Mexico (previous to) 1857. See Fig. 47.

Agave—*continued.*

A. Deserti (Desert's).* *fl.* yellow, under 2in. long, on a thyrsoid panicle, the branches very short, the lower horizontal, the upper ascending; pedicels short; scape 4ft. to 10ft. high, 1in. to 2in. thick at the base, furnished with distant lanceolate acuminate toothed bracts. *l.* few, in a rosette, oblanceolate, 6in. to 12in. long, 1½in. to 2in. broad above the middle, thick, fleshy, very glaucous; face deeply concave; terminal spine 1in. to 2in. long, slender; prickles crowded, strong, hooked, horny, nearly ½in. long. California, 1877.

A. Desmetiana (De Smet's). Probably synonymous with *A. miradorensis.*

A. Elemeetiana (Elemeet's).* *fl.* yellowish-green, 1in. to 1½in. long, in a dense spike 8ft. to 9ft. long, 7in. to 8in. in diameter when expanded; pedicels ½in. long; scape, including the spike, 12ft. to 13ft. high, stiffly erect, lower 3ft. to 4ft., barren, with squarrose lanceolate bracts. *l.* twenty to twenty-five in a rosette, lanceolate-oblong, 1½ft. to 2ft. long, 3in. to 6in. wide, slightly glaucous; face flat above the middle terminal spine, not pungent, the margin pale and quite entire. Stemless. A very distinct species. Mexico, 1864. (B. M. 7027).

A. Fenzliana (Fenzl's). Synonymous with *A. Hookeri.*

A. ferox (fierce). *fl.* unknown. *l.* about twenty in a rosette, oblong-spathulate, 4in. to 8in. broad; face nearly flat, except at the top, slightly glaucous green; terminal spine above 1in. long, hard, pungent; margin slightly wavy between the large dark brown teeth, which are about ½in. long, and curved at the top. Mexico, 1861.

A. filifera (thread-bearing).* *fl.* greenish, about 2in. long; pedicels very short and stout, in a dense spike 2ft. to 3ft. long; scape 3ft. to 4ft. long, its bract-leaves subulate, the lower ones ascending, the upper squarrose. *l.* sixty to a hundred in a dense rosette, stiff, straight, ensiform, 6in. to 9in. long, 1in. broad at the middle, gradually narrowing to a grey pungent tip; face flat, the continuous grey edge splitting off copiously into irregular spreading grey wiry threads; outer leaves of the rosette not all recurved, but spreading stiffly. Mexico.

A. f. filamentosa (thready).* A form with larger leaves and scape; including the spike, 10ft. to 12ft. high. A well-known, handsome variety.

A. Galeotti (Galeotti's). *fl.* unknown. *l.* thirty to forty in a dense rosette, 2ft. to 3ft. broad, oblong-spathulate, 1ft. to 1½ft. long, 2in. to 6in. broad; face rather flat or convex, green; terminal spine hard, pungent; prickles close, straight, or slightly hooked, purplish-black. Mexico, 1877.

A. Ghiesbreghtii (Ghiesbreght's). *fl.* unknown. *l.* thirty to forty in a dense rosette, rigid, lanceolate, 9in. to 12in. long, 2in. to 3in. broad, bright glossy green; terminal spine ½in. long, pungent; border narrow, red-brown till a late stage; side prickles numerous, irregular, two to three lines long. Mexico, 1862. Very handsome dwarf species. *A. Rohanii* and *A. Leguayana* are mere varieties.

A. heteracantha (various-spined).* *fl.* greenish, 1½in. long, on a dense spike 3ft. long; scape 3ft. to 4ft. long. *l.* fifty to eighty in a rosette, rigid, ensiform, 1½ft. to 2ft. long, 2in. to 2½in. broad in the middle, dull green, with numerous darker green lines on the back; terminal point 1in. long; side spines numerous, strongly hooked, lanceolate. Stemless. Mexico.

A. Hookeri (Hooker's).* *fl.* large, yellow, very numerous, in stalked panicled cymes. *l.* thirty to forty in a sessile rosette, 8ft. or 9ft. in diameter, oblanceolate-spathulate, bright green on the face, rather glaucous on the back, 4ft. to 5ft. long, 5in. to 9in. broad, 2in. to 3in. thick; terminal spine 2in. long, and decurrent for nearly half a foot; face flattish or slightly concave; side prickles irregular, brown and horny, about ½in. long, and curved in different directions. Mexico. SYN. *A. Fenzliana.* A rare and noble species, very massive.

A. horrida (horrid).* *fl.* unknown. *l.* thirty to forty in a dense rosette, rigid, lanceolate-spathulate, 8in. to 12in. long, 1in. to 2in. broad, bright green; terminal spine pungent, nearly 1in. long; margin furnished with a continuous broad grey border, with copious prickles ⅛in. to ½in. long.

A. h. Gilbeyi (Gilbey's).* *l.* about thirty, 3in. to 4in. long, 2in. broad, dark green with a pale stripe down the middle, three to four large spines on each side. Mexico, 1873.

A. h. lævior (smoother). *l.* somewhat narrower, longer, with marginal spines less strongly developed, and of a paler colour. Mexico, 1870.

A. h. macrodonta (long-toothed). *l.* fifty to sixty, 2½in. broad; spines larger than in the typical form. Mexico, 1876.

A. h. micrantha (small-toothed). Border of leaf narrower, and spines smaller, than in the typical form.

A. Jacobiana (Jacob's). Synonymous with *A. Salmiana.*

A. Kerchovei (Kerchove's).* *fl.* unknown. *l.* thirty to forty in a stemless rosette, stiff, rigid, typically ensiform, 6in. to 12in. long, 1½in. to 2in. broad, narrowing gradually to a pungent spine 1in. long, dull green, with a distinct pale central band, rounded on the back, without any stripes of dark green, the margin with a continuous moderately broad grey border; side prickles irregular, grey, lanceolate, curved, ⅛in. to ½in. long. SYN. *A. Beaucarnei.*

Agave—*continued.*

There are several varieties of *A. Kerchovei*, of which the following are the most important:—

A. K. diplacantha (double-spined).* With very few distant, small teeth, often collected or united in pairs.

A. K. inermis (unarmed). Dwarf, with spines entirely obsolete.

A. K. macrodonta (long-toothed). *l.* 1½ft. long, without any distinct central band, and with copious irregular grey lanceolate prickles, about ½in. long.

A. K. pectinata (comb-like). *l.* 1ft. long, 2½in. broad, without any central band.

A. lophantha (crest-flowered).* *fl.* greenish, arranged in a dense spike 4ft. to 5ft. long; scape 7ft. to 8ft. long, its leaves brown, the lower ones 6in. long. *l.* thirty to forty in a rosette, rigid, ensiform, 2ft. to 3ft. long, 1½in. broad at the middle, rather concave down the face, rounded on the back, not marked with any lines, dull green; terminal spine 1in. long; margins bordered by a very narrow continuous grey hoary line, furnished with distant linear falcate teeth, about $\frac{1}{12}$in. long, sessile. Mexico.

A. l. cœrulescens (bluish).* *l.* with a decided glaucous bloom.

A. l. longifolia (long-leaved). A mere variety of above species.

A. macracantha (long-spined).* *fl.* greenish, 2in. long, ten to twelve in a loose raceme 6in. long, all solitary on ascending pedicels ½in. to ¾in. long; scape 2ft. to 3ft. long; bracts erect. *l.* thirty to fifty in a stiff rosette 1ft. to 2ft. broad, oblanceolate, 6in. to 12in. long, 1in. to 1½in. broad, very stiff and rigid, very glaucous; face rather thicker in the lower half; terminal spine nearly black, very pungent, ½in. long; side prickles purplish-black, sub-distant, ½in. long, with a large point straight or slightly hooked. With a short stem, or stemless. Mexico, 1830. It has many varieties, among which are *A. Bessereriana* and *A. flavescens.*

A. Maximiliana (Maximilian's).* *fl.* unknown. *l.* about twenty in a sessile rosette, oblanceolate-spathulate, 1½ft. to 2ft. long, 1¾in. to 3in. broad; face slightly glaucous green; terminal spine pungent, brown, 1in. broad; side prickles bright chestnut brown, larger and more irregular than in *A. americana*, more hooked, and furnished with longer and sharper points, reaching ½in. long. Mexico. A very distinct species.

A. micracantha (small-spined). *fl.* yellowish, 1½in. long, in a dense spike 3ft. to 4ft. long, 6in. to 7in. broad when expanded. *l.* twenty to thirty in a shortly stalked rosette, oblanceolate oblong, 15in. to 18in. long, 3in. to 5in. broad above the middle, narrowed to 2in. to 3in. above the base, bright green; face flattish above the centre; terminal spine red brown, moderately firm; the copious close reddish-brown horny teeth about $\frac{1}{12}$in. long, the upper ones ascending, the lower deflexed. Mexico, 1860.

A. miradorensis (Mirador).* *fl.* unknown. *l.* about thirty in a sessile rosette, oblanceolate-spathulate, 1½ft. to 2ft. long, 2in. to 2½in. broad above the middle, thin but firm in texture, very glaucous, with a firm red-brown terminal spine 1in. long; side prickles very minute, crowded, colourless, five or six to an inch in the centre of the leaf. Mexico, 1869. SYN. (probably) *A. Desmetiana.*

A. Noackii (Noack's). A synonym of *A. Sartorii.*

A. ornata (adorned). A synonym of *A. americana picta.*

A. Ortgiesiana (Ortgies'). A dwarf form of *A. schidigera* with a pale central band to the leaf. Mexico, 1861. A widely-distributed and desirable species.

A. pendula (pendulous). Synonymous with *A. Sartorii.*

A. polyacantha (many-spined).* *fl.* greenish-yellow, 1½in. to 2in. long; flowering-stem 8ft. to 12ft. high, including the dense spike, which is 3ft. to 4ft. long. *l.* about thirty in a sessile rosette, oblanceolate-spathulate, rigid, 1ft. to 2ft. long, 2½in. to 5in. broad above the middle, bright green, slightly glaucous when young; terminal spine dark brown, pungent, ½in. to ¾in. long; side prickles crowded, deltoid, dark chestnut brown, irregular, $\frac{1}{10}$in. or ⅛in. long, all sub-patent. Mexico, 1800. SYNS. *A. uncinata, A. xalapensis.*

A. Poselgerii (Poselger's). *fl.* purplish, rather more than 1in. long; scape, including the spike, 6ft. to 10ft. *l.* twenty to thirty in a dense rosette, rigid, ensiform, 1ft. to 1½ft. long, 1½in. to 2in. broad at the middle, dull green, with a broad pale band down to the face, rounded and marked with numerous distinct green lines down the back; margin furnished with a continuous straight, moderately broad edge; terminal spine 1in. long, brown, pungent; side prickles moderately close, lanceolate, hooked, ⅛in. long. Trunk, 4in. to 6in. long. Texas.

A. potatorum (drinkers'). *fl.* greenish yellow, 3in. long; scape 12ft. high, including the thyrsoid panicle, which is 4ft. to 5ft. long. *l.* about twenty in a dense sessile rosette, 4ft. to 5ft. broad, oblong-spathulate, 2ft. to 2½ft. long, 7in. to 9in. broad above the middle, a dull glaucous green; face slightly concave; terminal spines hard, pungent, 1½in. to 2in. long; side prickles deltoid-cuspidate, about ½in. long, with the edge slightly wavy between them. Mexico, 1830.

A. pruinosa (frosty).* *fl.* unknown. *l.* ten to twenty in a dense rosette, spreading, oblanceolate-oblong, 1½ft. to 2ft. long, 4in. to 5in. broad above the middle, soft and fleshy in texture, pale glaucous green; terminal spine very weak; edge furnished with minute irregular spreading deltoid serrations, not more than quarter line long. Mexico, 1863. A very distinct species.

A. Roezliana (Roezl's). *fl.* unknown. *l.* twenty to thirty in a ses-

Agave—*continued.*

sile rosette, stiff, ensiform, 6in. to 7in. long, 1in. to 1½in. broad at the middle, bright glossy green, with a distinct pale band down the centre, broadly rounded on the back, without any darker green lines, margined with a continuous moderately broad border, red brown at first, fading into grey when old; terminal spines bright reddish brown, pungent, ½in. to ¾in. long; side prickles copious, spreading, lanceolate, curved, ¼in. long. Mexico, 1869.

A. Salmiana (Prince Salm-Dyck's).* *fl.* greenish yellow, 4in. long; panicle thyrsoid, 6ft. to 8ft. long, with erecto-patent branches and flowers in dense clusters; scape, exclusive of the panicle, 20ft. high. *l.* twelve to thirty in a dense rosette, which is often 5ft. to 6ft. broad, oblanceolate-spathulate, 2ft. to 4ft. long, 4in. to 6in. broad above the middle, a dull, slightly glaucous green; face more or less concave; terminal spine 1½in. to 2in. long, hard and pungent; side prickles ½in. long, chestnut brown, hooked up or down. Mexico, 1860. SYNS. *A. atrovirens*, *A. Jacobiana*, *A. tehuacensis.*

A. S. latissima (very broad). *l.* 2ft. to 3ft. long, by 8in. to 9in. broad above the middle.

A. Sartorii (Sartor's). *fl.* greenish, 1½in long; pedicels very short, in a dense spike about 3ft. long, 5in. to 6in. broad when expanded; scape 3ft. to 4ft. long, the green linear ascending bracts 2in. to 4in. long. *l.* thirty to forty spaced out in a loose rosette, ensiform, 1½ft. to 2ft. long, 3in. broad at the middle, bright green, with a pale band down the middle; face flat; terminal spine small, not pungent; side prickles minute, crowded, spreading, tipped with red-brown. Caudex 1ft. to 2ft. long, sometimes forked. SYNS. *A. cæspitosa*, *A. Noackii*, *A. pendula.*

A. schidigera (spine-bearing).* *fl.* almost identical with *A. filifera*. *l.* fifty to eighty in a dense sessile rosette, stiff, ensiform, 12in. to 15in. long, ¾in. to 1in. broad at the middle, similar in colour and texture to those of *A. filifera*, but the grey marginal border, and splitting off into flat shavings, not mere threads.

A. Schnittspahni (Schnittspahn's). Referred to *A. Scolymus.*

A. Scolymus (Scolymus). *fl.* greenish yellow, 2½in. to 3in. long; branches few, with the flowers at the end in very dense clusters; scape 14ft. to 16ft. high, including the thyrsoid panicle, which is 4ft. long and 2ft. broad, furnished with green bracts. *l.* twenty to thirty in a dense rosette 1½ft. to 3ft. broad, oblong-spathulate, 9in. to 18in. long, 3in. to 6in. broad above the middle, very glaucous, abruptly terminating in a pungent spine, 1in. or more long; side prickles chestnut brown, about ¼in. long; edge wavy between them; those on the lower half smaller and directed downwards. Mexico, 1830. Other so-called species referred to this are *A. amœna*, *A. crenata*, *A. cucullata*, *A. Schnittspahni*, and *A. Verschaffeltii.*

A. S. Saundersii (Saunders'). *fl.* about 1ft. long; teeth very large.

A. Seemanni (Seemann's).* *fl.* unknown. *l.* twenty in a sessile rosette, 1ft. to 1½ft. broad, oblong-spathulate, 6in. to 9in. long, 3in. to 3½in. broad at the middle, narrowed to 2in. above the dilated base, slightly glaucous; face flat, except close to the top; terminal spine pungent, dark brown, ¼in. long; side prickles large, moderately close, slightly curved upwards or downwards. Guatemala, 1868. There are two or three garden forms of this species.

A. Shawii (Shaw's).* *fl.* greenish yellow, 3in. to 3½in. long; panicle thyrsoid, about 2ft. long and broad; clusters dense, composed of thirty to forty flowers, surrounded by large foliaceous fleshy bracts. *l.* fifty to sixty, or more, forming a dense globose sessile rosette 2ft. in diameter, oblong-spathulate, 8in. to 10in. long, 3½in. to 4½in. broad at the middle, deep green; terminal spine brown, 1in. long, the upper third or quarter entire, the rest furnished with crowded upcurved lanceolate prickles, ¼in. to ½in. long. California, 1877. This species is very rare at present, but is a most distinct and handsome plant.

A. sobolifera (soboliferous). *fl.* greenish yellow, 2in. to 2½in. long, in a deltoid panicle, of which the lower panicles are 9in. to 12in. long, and bear a hundred flowers each; pedicels ¼in. to 1in. long; scape 8ft. to 10ft. high, 2½in. thick at the base. *l.* twenty to forty in a shortly caulescent rosette, oblanceolate-oblong-spathulate, 2ft. to 3ft. long, 3in. to 5in. broad at the middle, very bright green; face deeply channelled, the border much raised and tip often recurved; terminal spine sub-pungent, chestnut brown, ½in. long; side prickles distant, brown, hooked, $\frac{1}{12}$in. to ¼in. long. West Indies, 1678.

A. striata (striated-leaved).* *fl.* brownish green outside, yellow inside, 1in. to 1¼in. long; pedicels very short; spike dense, 2ft. to 3ft. long; bracts linear, shorter than the flowers; scape 6ft. to 8ft. high, including the spike, furnished with numerous spreading subulate bracts, which are 2in. to 3in. long. *l.* 150 to 200 in a dense rosette, linear-ensiform, 2ft. to 2½ft. long, ¼in. to ⅜in. broad above the deltoid dilated base, where they are ½in. thick and 1in. broad, narrowed gradually from the top of the base to the point, rigid in texture, glaucous green; face rather keeled, and the back more so; point brown, pungent, ¼in. long; edges minutely serrulate. Mexico, 1856.

A. s. echinoides (Echinus-like). *l.* about 6in. long, ½in. broad at the middle; face flat. Mexico, 1869. Dwarfer and stiffer in habit than the variety *stricta.*

Agave—*continued.*

A. s. recurva (recurved-leaved). *l.* longer than in the type, 3ft. to 4ft., more or less falcate, narrower, and decidedly convex on both surfaces.

A. s. stricta (upright). *l.* about 1ft. long, very stiff, ½in. broad at the middle, both faces convex. *A. Richardsii* comes near to this variety.

A. tehuacensis (Tehuan). Synonymous with *A. Salmiana.*

A. uncinata (hooked). Synonymous with *A. polyacantha.*

A. univittata (one-striped).* *fl.* green, 1½in. long (or less); spike 10ft. to 12ft. long, 6in. to 7in. thick; pedicels ½in. long; scape 4ft. long, exclusive of the spike, its bracts dense and squarrose. *l.* fifty to eighty in a stemless rosette, rigid, ensiform, 2ft. to 2½ft. long, 2in. to 3in. broad at the middle, narrowed slightly downwards, and very gradually upwards, dull green, with a broad pale band down the face, faintly lineate on the back; margin bordered by a narrow, continuous grey horny line, furnished with hooked lanceolate prickles, ½in. long, from ½in. to 1in. apart; terminal spine brown, pungent, 1in. long. Mexico, 1830.

A. utahensis (Utahan).* *fl.* yellowish, about 1in. long; peduncles ultimately ½in. long; scapes, 5ft. to 7ft. high, including the 1ft. to 2ft. spike. *l.* stemless, ensiform, 6in. to 12in. long, 1in. to nearly 2in. broad, thick, glaucous; terminal spine channelled, pungent, about 1in. long; marginal prickles, ⅛in. to ½in. long, white, with a darker base. Southern Utah, 1881. This is a true alpine species, perfectly hardy, and of very easy culture.

A. Vanderdonckii (Vanderdonck's). Synonymous with *A. xylacantha.*

A. variegata (variegated).* *fl.* greenish, about 1½in. long; spike about 1ft. long, fifteen to twenty flowered; bracts minute, deltoid; scape 2ft. long, exclusive of the spike, bearing about twelve lanceolate bract leaves. *l.* fifteen to eighteen in a sessile rosette, spreading, ligulate-lanceolate, finally 12in. to 15in. long, 1in. to 2in. broad below the middle, narrowed slightly downwards, and gradually to the point, deeply chanelled down the face, and copiously spotted with brown on a green ground; edge hard and tough, very obscurely serrulate. Texas, 1865. This very desirable variegated species is extremely rare in cultivation.

A. Verschaffeltii (Verschaffelt's). Referred to *A. Scolymus.*

A. Victoriæ Regina (Queen Victoria).* *l.* forty to fifty in a sessile rosette, stiff, rigid, lanceolate, 6in. long, 1½in. to nearly 2in. broad above the dilated base, narrowed gradually to a rather obtuse point, dead green, margined with a continuous white border, like that of *A. filifera*, not splitting up into threads, but leaving distinct white vertical bands where it is pressed against the neighbouring leaves; terminal spine ½in. long, black, pungent, with usually one or two small spines on each side of it. Mexico, 1875. This is also much too rare a plant. SYN. *A. Consideranti.*

A. virginica (Virginian).* *fl.* greenish yellow, 1in. to 1½in. long; spike very loose, 1ft. to 1½ft. long; lower flowers with very short pedicels and lanceolate bracts, about ½in. long; scape 2ft. to 3ft. high, exclusive of the spike, with only a few distant small bract leaves. *l.* ten to fifteen in a sessile rosette, spreading, lanceolate, 6in. to 12in. long, 1in. to 1½in. broad below the middle, narrowed gradually to the point and a little downwards; face channelled, undulated, pale green, or mottled with brown spots, the narrow hard and tough margin very obscurely serrulate. North America, 1765. *A. conduplicata* is said to be allied to this species.

A. vivipara (viviparous).* *fl.* greenish yellow, 1½in. to 2in. long, often changed into bulbillæ, which bear lanceolate leaves 6in. long before they fall and take root; inflorescence reaching a height of 20ft. or more, the deltoid panicle about a quarter of the length of the scape; corymbs on stout peduncles, pedicels short. *l.* twenty to fifty in a dense, shortly caulescent rosette, ensiform, 2ft. to 3ft. long, 1½in. to 2in. broad at the middle, whence it gradually narrows to the point, dull green when mature, thin but firm in texture, flat or channelled down the face; terminal spine firm, brown, ½in. long; side teeth brown, hooked, $\frac{1}{12}$in. or less long. A very widely spread species throughout tropics of the Old World, 1731. SYNS. *A. cantula*, *A. bulbifera.*

A. Warelliana (Warell's).* *l.* about thirty in a rosette, oblong-spathulate, 9in. to. 10in. long, 3in. broad above the middle, narrowed to 2in. above the dilated base; face nearly flat, green, scarcely at all glaucous, tipped with a strong brown channelled spine 1in. long; border margined with close, very short teeth, dark purple when mature. Mexico. A rare but very handsome species.

A. Wislizeni (Wislizenius's). *fl.* 2½in. long; panicle thyrsoid, its branches 3in. to 6in. long; pedicels very short; scape 12ft. high. *l.* about thirty in a dense, rigid, sessile rosette, which is under 2ft. broad, oblong-spathulate, 3in. to 3½in. broad above the middle, very glaucous, concave in the upper part; terminal spine hard, pungent, dark brown, 1in. long, and decurrent down the border a little; side prickles ⅜in. long, dark purple, moderately close, those below the middle of the leaf smaller and curved downward. Mexico, 1847.

A. xalapensis. Synonymous with *A. polyacantha.*

A. xylonacantha (woody-spined).* *fl.* green, 1½in. long; spike dense, rather shorter than the scape, its bracts linear-subulate; scape 5ft. to 6ft. long, its bracts subulate, all ascending, the lower ones 6in. to 8in. long. *l.* not more than twenty in a stemless rosette,

Agave—*continued.*

ensiform, diverging irregularly and often curving, 1½ft. to 3ft. long, 2in. to 3in. (rarely 4in.) broad at the middle, narrowed gradually upwards, a slightly glaucous dead green, marked with a few darker green lines on the back, furnished with a broad continuous horny border and a few very large irregular hooked teeth, often united or collected in pairs, ½in. to ¾in. long, and ¾in. to ½in. broad; terminal spine brown, pungent, 1in. long. Mexico. A long-known, widely-spread, and distinct species. SYNS. *A. amurensis* and *A. Vanderdonckii.*

A. x. hybrida is a striking dwarf variety with vittate leaves, and smaller, more crowded deltoid-cuspidate prickles than in the type. It is also commonly known as *A. x. vittata* and *A. perbella.*

FIG. 48. AGAVE YUCCÆFOLIA.

A. yuccæfolia (Yucca-leaved).* *fl.* greenish yellow, 1¼in. to 1½in. long, in a dense spike 6in. to 15in. long, about 14in. in diameter, sessile, solitary, or in pairs; scape 12ft. to 20ft. high. *l.* twenty to forty in a dense, shortly-stemmed rosette, linear, much recurved, 1½ft. to 2½ft. long, ¾in. to 1in. broad at the middle; face deeply channelled, dull, rather glaucous green, with a pale band down the centre, the tip not at all pungent, the back broadly rounded, edge entire, or obscurely serrulate. Mexico, 1816. A most distinct species. See Fig. 48.

AGERATUM (from *a*, not, and *geras*, old; in reference to the flowers being always clear). SYN. *Cœlestina.* ORD. *Compositæ.* This genus includes several American species, for the most part half-hardy annuals and biennials; or, if the seed is not allowed to ripen, they become perennials. Involucre cup-shaped, of many imbricated linear bracts; receptacle naked. Leaves opposite. A light rich soil is most suitable. Very easily increased by cuttings or seeds; if required true, the former is the only sure method of propagation. To grow large plants for greenhouse decoration, sow the seeds in January, in heat, in sandy soil,

Ageratum—*continued.*

barely covering them. As soon as the young plants are large enough, prick them off into thumb pots, and keep in heat till they grow freely, then place them into a cooler house. Transfer into larger pots as soon as the others are full of roots, until they are finally shifted into 10in. or 12in. pots. When these are full of roots, the plants should be watered with liquid manure twice a week, and they soon flower well, making fine specimens. During hot weather especially, they should be well syringed with clear water daily, to keep down red spider. The plants required for bedding (for which purpose the dwarf garden varieties are mostly used) should be raised about the same time, kept in small pots, gradually hardened off, and planted out in the middle or end of June. Cuttings of all the varieties strike readily in heat, treated like most soft-wooded plants, and, when rooted, may be managed as recommended for the seedlings.

A. Lasseauxii (Lasseaux's). *fl.-heads* rose-coloured, small, disposed in corymbose heads. Summer. *l.* lanceolate-elliptic. *h.* 1½ft. to 2ft. Monte Video, 1870. A much-branched plant, requiring greenhouse protection in winter, and suitable for planting out in summer.

A. latifolium (broad-leaved). A synonym of *Piqueria latifolia.*

A. mexicanum (Mexican).* The commonest and most useful species, with a profusion of lilac-blue flowers. *h.* 2ft. Mexico, 1822. When used for bedding purposes it may be pegged down like the Verbena, or be allowed to grow its full height. Several very dwarf varieties of it have originated under cultivation, which supersede the species for bedding, the best of which are:—CUPID,* rich blue, very dwarf and floriferous; IMPERIAL DWARF, about 9in. high, with porcelain blue flowers; LADY JANE, of the same colour, very free; QUEEN,* silvery grey, about 9in. high; SNOWFLAKE,* white, very free and showy; SWANLEY BLUE,* very deep blue, 6in. to 8in. high. There is also a white-flowered variety of *Mexicanum*, which is very showy; and a variegated form, sometimes grown for the sake of its pretty foliage.

AGGLOMERATE, AGGLOMERATED. Collected into a heap or head.

AGGLUTINATED. Glued together.

AGGREGATE, AGGREGATED. Gathered together; usually applied to the inflorescence.

AGLAIA (mythological: from Aglaia, the name of one of the Graces, and given to this genus on account of its beauty and the sweet scent of the flowers). ORD. *Meliaceæ.* Stove evergreen trees or shrubs having very small flowers, disposed in branched axillary panicles. Leaves alternate, trifoliate, or impari-pinnate. There are several species, but the undermentioned is the only one worth growing yet introduced. It thrives well in a mixture of turfy loam and peat. Young cuttings ripened at the base, and taken off at a joint, will root in sand under a hand glass, in heat.

A. odorata (sweet-scented). *fl.* yellow, small, in axillary racemes, very sweet-scented, said to be used by the Chinese to scent their teas. February to May. *l.* pinnate, with five or seven glossy leaflets. *h.* 8ft. to 10ft. China, 1810.

AGLAOMORPHA. *See* **Polypodium.**

AGLAONEMA (from *aglaos*, bright, and *nema*, a thread; supposed to refer to the shining stamens). ORD. *Aroideæ.* Stove perennials, allied to *Arum*, and requiring similar treatment to the stove species of that genus.

A. commutatum (changed).* *fl.* white. *l.* greyish-blotched. *h.* 1ft. Philippines, 1863. SYN. *A. marantæfolium maculatum.*

A. Mannii (Mann's).* *fl.*, spathe 2in. long, whitish, with a spadix one-third shorter, bearing white anthers and scarlet ovaries. *l.* elliptic-oblong, dark green. Stems thickish, erect. *h.* 1½ft. Victoria Mountains, 1868.

A. marantæfolium maculatum (Maranta-leaved, spotted). A synonym of *A. commutatum.*

A. pictum (painted).* *fl.*, spathe pale creamy yellow, folded round so as to appear globular-oblong, opening at top; spadix projecting, white. August. *l.* elliptic-acuminate, light green, blotched irregularly with broadish angulate patches of grey. Stems slender, erect. *h.* 1ft. to 2ft. Borneo.

AGNOSTUS. *See* **Stenocarpus.**

AGRAPHIS. Included under **Scilla** (which *see*).

AGRIMONIA (from *argos*, white; the cataract of the eye being white. Once reputed to contain medicinal qualities). Agrimony. ORD. *Rosaceæ*. A genus of hardy herbaceous perennials, with interruptedly pinnate leaves, each accompanied by a pair of stipules united to the petioles. Flowers small, numerous, spiked; calyx turbinate, involucrated by bristles; petals five. They are all of the easiest culture, growing in ordinary soil. Readily increased by root-division. The most showy species in cultivation are described below.

A. Eupatoria (Eupatoria). *fl.* yellow, on an elongated spike. *l.* with elliptic-oblong, coarsely serrated leaflets, odd one stalked. *h.* 1ft. to 2ft. Britain.

A. nepalensis (Nepaul). *fl.* yellow, on erect, slender racemes. *l.* with ovate, serrated leaflets, odd one stalked, villous. *h.* 1ft. to 2ft. Nepaul, 1820.

A. odorata (sweet-scented).* *fl.* yellow; spikes several. *l.* with oblong lanceolate, deeply crenate-toothed leaflets, hairy. *h.* 2ft. to 3ft. Italy, 1640.

AGRIMONY. *See* **Agrimonia.**

AGRIOTES. *See* **Wireworm.**

AGROSTEMMA (from *agros*, a field, and *stemma*, a crown; alluding to the beauty of the flowers, which were formerly made into crowns or garlands). Rose Campion. ORD. *Caryophylleæ*. Hardy evergreen perennials and annuals, with broadish leaves, and one-flowered peduncles. Of easy culture, and well adapted for borders. They will all grow freely in common garden soil. Increased by division of the roots, and seed. *A. cœli-rosa*, and *A. flos-Jovis* are, perhaps, species of *Lychnis*, but the generic name which we have adopted is the most common one. All the species of this genus are exceedingly pretty free-flowering plants, and both annuals and perennials are well worth growing.

A. cœli-rosa (rose of Heaven).* *fl.* delicate rose, white, or bright purple, solitary, terminal, Summer. Levant, &c., 1713. An annual species about 1ft. high, not tomentose; should be grown in patches. Sow the seed in April.

FIG. 49. AGROSTEMMA CŒLI-ROSA FIMBRIATA.

A. c.-r. fimbriata (fimbriate). A form having fimbriated petals Known also as *nana*. *h.* 9in. See Fig. 49.

A. c.-r. purpurea (purple).* A very pretty form, having dark purple flowers, and compact habit. See Fig. 50.

A. coronaria (crowned).* *fl.* white, with the middle red; petals emarginate, crowned, serrated; peduncles elongated, one-flowered. July. *l.* lanceolate, very broad, leathery; plant woolly throughout. *h.* 1ft. to 2ft. South Europe, 1596. This species is admirably adapted for naturalising on dry hill sides, and in the wild

Agrostemma—*continued.*

FIG. 50. AGROSTEMMA CŒLI-ROSA PURPUREA.

garden. There are several varieties seen in gardens with a great diversity of colour, including dark crimson, white, and sometimes double flowers. See Fig. 51.

FIG. 51. AGROSTEMMA CORONARIA, showing Habit and Flower.

A. flos-Jovis.* Flower of Jove. *fl.* purple or scarlet, in umbellate heads; peduncles short, rather branched. July. *l.* lanceolate. stem-clasping, silky, tomentose. *h.* 1½ft. Switzerland, 1726. Plant white from tomentum. See Fig. 52.

FIG. 52. AGROSTEMMA FLOS-JOVIS, showing Habit and Flower.

AGROSTIS (from *agros*, a field; the Greek name for a kind of Grass). Bent Grass. Including *Trichodium*. SYN. *Vilfa* (of Adanson). ORD. *Gramineæ*. Annual or perennial Grasses. Panicle loose; spikelets compressed. Several of the species are very effective, and well worth growing; and the spikes are pretty objects, when dried, for

Agrostis—*continued.*

window vases, &c. They are of easy culture, in ordinary garden soil. Sow seeds during spring in the open border, in tufts, among ferns, &c., or in pots for decorative purposes.

A. elegans (elegant). *h.* 1ft. Russia, 1834.

FIG. 53. AGROSTIS NEBULOSA.

A. nebulosa (cloud).* Cloud Grass. *fl.* panicles resemble, when developed, a cloud resting over the ground. *h.* 1½ft. Very light and elegant. Annual. See Fig. 53.

A. pulchella (pretty).* Dwarfer, and with a more rigid habit than *A. nebulosa*. It is, nevertheless, a most graceful plant, and valuable for bouquet making, and for winter decorative purposes. *h.* 6in. to 12in. Russia. Annual.

A. spica-venti (windward-spiked). *fl.* panicle large, silky looking, loosely spreading. England. Annual.

AGROTIS. *See* **Pot-herb Moths** and **Turnip Moth.**

AILANTUS (from *ailanto*, referring to its lofty growth). Tree of Heaven. ORD. *Xanthoxylaceæ*. Tall deciduous trees. The stove species will grow freely in a mixture of loam and peat; and the best way to increase these is by pieces of the roots, planted in a pot with their points above the ground, and placed in a hotbed, where they will soon make fine plants.

A. excelsa (tall). *fl.* whitish green, disposed similar to the following. *l.* abruptly pinnate, 3ft. long, with ten to fourteen pairs of leaflets coarsely toothed at the base, without glands. *h.* 66ft. India, 1800. A stove tree.

A. glandulosa (glandulous).* *fl.* whitish green, disposed in large branched, terminal, fascicled panicles, exhaling a disagreeable smell. August. *l.* impari-pinnate; leaflets coarsely toothed at the base with glands. (The leaves on vigorous young trees are sometimes 6ft. in length.) *h.* 60ft. China, 1751. This tree grows with great rapidity for the first ten or twelve years, in favourable situations, afterwards its growth is much slower. It is quite hardy, and thrives in almost any soil, though one that is light and somewhat humid, and a sheltered situation, suits it best. It is a very desirable tree for plantations, or to stand singly on lawns, and is easily increased by slips of the roots.

AINSLIÆA (in honour of Dr. Whitelaw Ainslie, author of a work on Indian drugs). ORD. *Compositæ*. Herbaceous perennials, of recent introduction. Although, no doubt, both species will prove tolerably hardy, they should have slight protection during winter. They thrive in light rich soil. Propagated by divisions of the root.

A. aptera (wingless). *fl.-head* purple, disposed in an elongated spike-like panicle. *l.* deeply cordate, sinuately toothed; petioles wingless, whence the name. Sikkim Himalayas, 1882.

A. Walkeræ (Mrs. Walker's).* *fl.-heads* slender, distant, shortly stalked, borne in erect or somewhat nodding racemes; the white corolla-lobes and the red purple anthers make a pretty contrast. *h.* about 1ft. Hong Kong, 1875. A very rare and graceful species.

AIR. Pure atmospheric air is composed of nitrogen, oxygen, and a very small quantity of carbonic acid gas, all of which are essential to the growth of plants. Air-giving is a term used by gardeners to lessen the temperature of a greenhouse, or to equalise it with that outside. *See* **Ventilation.**

AIRA (from *Aira*, applied by the Greeks to *Lolium temulentum*). Hair Grass. ORD. *Gramineæ*. Chiefly hardy grasses, of agricultural value. Panicle loose; spikelet compressed, with two perfect flowers, and sometimes a neuter. Of easy culture, in ordinary garden soil. Sow seeds in spring.

A. flexuosa (waved).* The Waved Hair Grass. *fl.* shining brown; panicle erect, spreading, with waved angular branches and flower-stalks. *l.* short. Stem upwards of 1ft. high, erect, smooth. England. A very pretty and graceful perennial.

FIG. 54. AIRA PULCHELLA.

A. pulchella (pretty).* *fl.* panicles loose, very delicate and graceful. *l.* very short. *h.* 6in. to 8in. South Europe. An elegant plant, with tufted filiform stems. One of the best of dwarf-growing ornamental grasses. See Fig. 54.

AIR-PLANT. *See* **Aerides,** also **Epiphytes.**

AITONIA (in honour of W. Aiton, once Head Gardener at Kew). ORD. *Meliaceæ*. A small and rather interesting greenhouse evergreen shrub from the Cape of Good Hope, and thriving well in an equal mixture of sandy loam and peat. Young cuttings will root in sand, under a bell glass, with bottom heat. The cuttings must not be put in very close together, and the glass should be wiped frequently, as they are apt to damp off.

A. capensis (Cape). *fl.* pink; petals four, shorter than the projecting stamens. July. *h.* 2ft. 1777.

AIZOON (from *aei*, always, and *zoos*, alive; tenacious of life). ORD. *Portulacaceæ*. Greenhouse annuals, biennials, or evergreen shrubs. Flowers apetalous; calyx five-cleft, coloured on the inner surface. The under-mentioned species is the only one worth growing. It requires no shade, a dry atmosphere, and light sandy soil. Propagated by seeds and cuttings.

A. sarmentosum (sarmentose). *fl.* greenish, sessile. Summer. *l.* opposite, linear-filiform, rather connate, glabrous; branches rather villous, three-flowered at the apex, the two lateral flowers are bracteated, and spring from the sides of the middle one. Sub-shrub, erect, diffuse, glabrous, branched. South Africa, 1862.

AJAX. This genus is included, by Baker, under *Narcissus*. The plant formerly known as *Ajax maximus* is now regarded as a mere form of **Narcissus Pseudo-Narcissus major** (which *see*).

AJUGA (from *a*, not, and *zugon*, a yoke; in reference to the calyx being equal, not bilabiate). Bugle. ORD. *Labiatæ*. Hardy annual or perennial herbaceous plants, usually procumbent or ascending, sometimes stoloniferous. Whorls two or many flowered, dense, sometimes all axillary, when the floral leaves conform to those of the stem; sometimes the superior whorls are approximate into spikes, then the floral leaves are small, and of a different form from the stem ones. All the species are of easy cultivation in ordinary garden soil. Perennials increased by divisions, or by seeds sown in the open border, during spring or autumn. The seeds of annual kinds may be sown in the open border in spring, where they are intended to remain.

Ajuga—*continued.*

A. alpina (alpine). Synonymous with *A. genevensis.*

A. australis (southern). *fl.* blue; whorls six or more flowered; lower whorls remote, upper ones sub-spicate, floral leaves similar to the stem ones, exceeding the flowers. May to July. *l.* narrow-oblong, narrowed at the base, quite entire or sinuated, thickish, rather villous. Stem ascending, or erect. *h.* 6in. New Holland, 1822. Perennial.

A. Chamæpitys (ground-pine). *fl.* yellow, dotted with red, pubescent outside; whorls two-flowered; floral leaves similar to the others, exceeding the flowers. April. *l.* deeply trifid, with linear, quite entire, or trifid lobes. Stem procumbent at the base, much branched, beset with long hairs, like the leaves. *h.* about 6in. England (rare). Annual.

A. genevensis (Geneva).* *fl.* varying from blue to rose colour and white; upper whorls spicate, lower ones distant, six or more flowered. May. *l.* stem ones oblong-elliptic or obovate, narrowed at the base; lower ones petiolate; floral ones ovate or cuneated; superior ones scarcely equalling the flowers or shorter, all usually coarsely toothed, membranous, green on both surfaces, and beset with scattered hairs. Stem erect, pilose. *h.* 6in. to 1ft. Europe. A very variable species, admirably adapted as an alpine plant, and succeeds best in bog soil, where its roots will have plenty of room; it increases rapidly. Perennial. SYNS. *A. alpina, A. rugosa.*

A. orientalis (oriental).* *fl.* blue; whorls six or more flowered, distant, or the upper ones are approximate. May. *l.* lower ones large, petiolate; ovate, coarsely and sinuately toothed, narrowed at the base; floral ones sessile, broad ovate, deeply lobed or toothed, exceeding the flowers. Stem ascending, pilosely woolly. *h.* 1ft. to 1½ft. Eastern Europe, 1732. This species should be grown in a dry, sunny spot.

A. pyramidalis (pyramidal).* *fl.* blue or purple; whorls many-flowered, upper ones or all spicate. May and June. *l.* stem ones approximate, scarcely petiolate, obovate; floral ones broad-ovate, clasping the flowers, tetragonally pyramidate; the upper ones often coloured, all quite entire or obscurely sinuated. Stem erect. *h.* 6in. Scotland. Perennial. Of this there are several handsome garden varieties.

FIG. 55. FLOWER OF AJUGA REPTANS.

A. reptans (creeping).* *fl.* varying from blue to rose-colour; lower whorls remote; upper ones spicate, six to twenty flowered. May. *l.* ovate or obovate, quite entire or sinuated, and, as well as the stem, nearly glabrous; radical one petiolate, stem ones nearly sessile. Stem creeping. The variegated and darkest leaved forms of this are superior to the type for horticultural purposes. Britain. Perennial. See Fig. 55.

A. rugosa (wrinkled). Synonymous with *A. genevensis.*

AKEBIA (its Japanese name). SYN. *Rajania.* ORD. *Lardizabalaceæ.* A pretty twining shrub, succeeding well in the south-western counties of England, or in Scotland, trained to a trellis, or rambling over other shrubs in the open; but, when so grown, it requires the protection of a mat in winter. It makes an excellent twiner for the cool greenhouse. Sandy loam, leaf soil, and peat are most suitable for its culture. Increased by root divisions and cuttings.

A. quinata (five-leafleted).* *fl.* purplish brown, small, in axillary racemes, very fragrant. March. *l.* on very slender petioles, and palmately divided into usually five distinct petiolulate oval or oblong emarginate leaflets, the bottom pair smallest. *h.* 10ft. Chusan, 1845.

AKEE-TREE. *See* **Blighia sapida.**

ALA. A lateral petal of a papilionaceous flower.

ALANGIACEÆ. A very small order of trees or shrubs, usually with inconspicuous flowers, in axillary fascicles. Fruit succulent, eatable. The two genera best known in this country are *Alangium* and *Nyssa.*

ALANGIUM (from *Alangi*, the Malabar name of the first species). ORD. *Alangiaceæ.* Very showy stove evergreen trees, with alternate, exstipulate, entire leaves. Flowers few, sessile, in axillary fascicles; calyx campanulate; petals linear, spreadingly reflexed. They thrive well in a mixture of loam and peat, or any light rich soil. Cuttings root readily if planted in a pot of sand, with a hand glass placed over them, in heat.

Alangium—*continued.*

A. decapetalum (ten-petaled).* *fl.* pale purple, with a grateful scent, solitary, or two to three together in the axils of the leaves; petals ten or twelve. June. *l.* alternate, oblong-lanceolate, quite entire; branches glabrous, spinescent. *h.* 30ft. Malabar, 1779.

A. hexapetalum (six-petaled). *fl.* purple, six-petaled. *l.* ovate-lanceolate, acuminated, velvety beneath. *h.* 30ft. Malabar, 1823.

ALATUS. Furnished with a membranous or thin wing or expansion.

ALBESCENT. Growing white.

ALBICANT. Growing whitish.

ALBINISM. A pale condition due to the absence of chlorophyl.

ALBIZZIA (named after an Italian). ORD. *Leguminosæ.* Ornamental greenhouse or hardy trees or shrubs. For culture, *see* **Acacia,** to which they are often referred.

A. Julibrissin (Julibrissin). *fl.* white; heads pedunculate, forming a terminal somewhat corymbose panicle. August. *l.* with eight to twelve pairs of pinnæ, each pinna bearing about thirty pairs of dimidiate-oblong, acute, rather ciliated leaflets. *h.* 30ft. to 40ft. Hardy. Levant, 1745. SYN. *A. Nemu.*

A. lophantha (crest-flowered).* *fl.* yellow; racemes ovate-oblong, axillary, twin. May. *l.* with eight to ten pairs of pinnæ, each pinna bearing twenty-five to thirty pairs of linear, bluntish leaflets; petioles and calyces clothed with velvety down. *h.* 6ft. to 10ft. New Holland, 1803. A very distinct unarmed greenhouse species, and one of the best for window gardening.

A. Nemu. A synonym of *A. Julibrissin.*

ALBUCA (from *albicans*, or *albus*, white; the colour of the earlier species). ORD. *Liliaceæ.* A rather extensive genus of Cape of Good Hope bulbs, requiring ordinary greenhouse culture. Closely allied to *Ornithogalum.* Perianth six-cleft, three outer segments spreading; three inner ones closed over the stamens. They, however, succeed admirably when grown in a warm sunny position out of doors, if covered with a hand glass, or litter, during winter. A light loamy soil, with leaf mould and sand, suits them well. Propagated by offsets from the old bulb, or seeds. There are but few species worthy of cultivation.

A. angolensis (Angolan). *fl.* yellowish, large, in cylindrical racemes 1ft. to 1½ft. long. *l.* linear-lorate, sub-erect, fleshy, pale green, 1½ft. to 2ft. long. *h.* 3ft. Angola.

A. aurea (yellow).* *fl.* pale yellow, upright; peduncle very long, erect, spreading. June. *l.* linear-lanceolate, flat. *h.* 2ft. 1818.

A. fastigiata (peaked).* *fl.* white; peduncle very long, spreading. May. *l.* linear, flattish, longer than the scape. *h.* 1½ft. 1774.

A. flaccida (weak). *fl.* pale yellow, with a green keel, drooping, six to eight in a loose raceme; peduncles spreading at right angles. July. *l.* lanceolate-linear, obliquely bent. *h.* 2ft. 1791.

A. Nelsoni (Nelson's).* *fl.*, perianth, 1½in. long, ascending, white, with a dull red stripe down the back of each segment; scape stout, 4ft. to 5ft. high. Summer. *l.* bright green, very concave at the basal part, nearly flat in the upper part, 3ft. to 3½ft. long, 1½in. to 2½in. broad, at about one-third the way up, whence they are gradually narrowed to an acute point. Natal, 1880. This very handsome species is the best of the genus.

ALBUMEN. The substance under the inner coat of the testa of seeds, surrounding the embryo. It is sometimes absent.

ALBUMINOUS. Furnished with albumen.

ALBURNUM. The white wood of a tree; the younger wood, not choked up by sedimentary deposit, and therefore permeable to fluids.

ALCHEMILLA (from *Alkemelyeh*, the Arabic name of one of the species). Lady's Mantle. ORD. *Rosaceæ.*

Alchemilla—*continued.*

Hardy herbaceous perennials, with corymbose, apetalous flowers; calyx tubular, with the tube rather contracted at the apex. Leaves palmate or lobed. Of very easy culture, in common, but well drained soil. They are well adapted for rockwork and planting near the front of borders. Easily increased by divisions of the roots, and seeds. All here described are hardy, except *A. sibbaldiæfolia.*

A. alpina (alpine).* *fl.* greenish, small; corymbose. June. *l.* digitate; leaflets five to seven, lanceolate-cuneated, obtuse, serrated, clothed with white satiny down beneath. *h.* 6in. Britain.

A. pubescens (pubescent). *fl.* greenish; corymbs terminal, crowded, clothed with a coating of long weak hairs. June. *l.* roundish-reniform, seven-lobed, toothed, silky beneath. *h.* 6in. to 8in. Caucasus (Higher), 1813.

A. sericea (silky).* *fl.* greenish, corymbose. June. *l.* digitate; leaflets seven, lanceolate-obovate, obtuse, connected at the base, serrated at the apex, clothed with satiny down beneath. *h.* about 6in. Caucasus, 1813. Much larger in every part than *A. alpina*, to which it is closely allied.

A. Sibbaldiæfolia (Sibbaldia-leaved). *fl.* white, conglomerate; stem corymbosely many-flowered at the apex. July. *l.* deeply three-parted, clothed with adpressed pubescence beneath; segments deeply serrated, lateral ones bifid. *h.* 6in. Mexico, 1823. A greenhouse species, which should be grown in small well-drained pots, with a mixture of leaf soil and sandy loam.

ALDEA. A synonym of **Phacelia** (which *see*).

ALDER. *See* **Alnus.**

ALETRIS (from *aletron*, meal; referring to the powdery appearance of the whole plant). The American Star Grass. SYN. *Tritonia.* ORD. *Hæmodoraceæ.* Interesting hardy herbaceous perennials, closely allied to the *Amaryllids.* Perianth half-inferior, tubular; limb spreading or funnel-shaped; stamens inserted at base of perianth segments, filaments flat. They delight in a sunny but damp situation, with peat, leaf mould, and sand, and are slowly increased by division of the roots.

A. aurea (golden).* *fl.* yellow, bell-shaped. *h.* 1ft. to 2ft. North America, 1811. Similar in habit to *A. farinosa.*

A. capensis (Cape). *See* **Veltheimia viridifolia.**

A. farinosa (mealy).* *fl.* white, bell-shaped, in a terminal spiked raceme, upon stems 1½ft. to 2ft. high. *l.* lanceolate, ribbed. North America, 1768. A pretty species, forming a spreading tuft, and possessing intensely bitter properties.

ALEURITES (from the Greek word signifying floury; all the parts of the plant seeming to be dusted with a farinaceous substance). ORD. *Euphorbiaceæ.* A handsome stove evergreen tree, with small, white, clustered flowers. Leaves alternate, stalked, exstipulate. Of easy culture in a loamy soil. Ripe cuttings, with their leaves untouched, root readily in sand, under a hand-glass.

A. triloba (three-lobed).* Candleberry Tree. *l.* three-lobed, 4in. to 8in. long. *h.* 30ft. to 40ft. Moluccas and South Pacific Islands, 1793.

ALEXANDERS. *See* **Smyrnium.**

ALEXANDRIAN LAUREL. *See* **Ruscus racemosus.**

ALGAROBA BEAN, or CAROB. *See* **Ceratonia.**

ALGAROBIA. Included under **Prosopis** (which *see*).

ALHAGI (its Arabian name). ORD. *Leguminosæ.* Manna Tree. Greenhouse shrubs or sub-shrubs, with simple leaves, and minute stipulas. Flowers few, in clusters. They thrive in pots filled with a mixture of sand, loam, and peat. Young cuttings will root in sand, with a bell glass placed over them, in heat; but by seeds, if they can be procured, sown in a hotbed, is a preferable mode of increasing the plants. They may be placed out of doors during the summer months.

A. camelorum (camels). *fl.* red, few, disposed in racemes along the peduncles. July. *l.* lanceolate, obtuse, simple; stipulas minute. Stem herbaceous. *h.* 1ft. to 2ft. Caucasus, 1816.

A. maurorum (Moors'). *fl.* purple in the middle, and reddish about the edges, disposed in racemes along the axillary, spinose peduncles. July. *l.* obovate-oblong, simple; spines strong, and longer than those of the above species. *h.* 2ft. to 3ft.

Alhagi—*continued.*

Egypt, &c. The Manna is a natural exudation from the branches and leaves of this shrub, which takes place only in very hot weather.

ALIBERTIA (in honour of M. Alibert, a celebrated French chemist, author of "Traite des Fievres Attaxiques," wherein he mentions the effects of Peruvian bark). ORD. *Cinchonaceæ.* A small stove evergreen tree, very ornamental when in flower. Flowers solitary or fascicled, diœcious; corolla leathery, tubular. A mixture of loam and peat is the best soil. Cuttings strike root freely, in a similar kind of soil, under a hand glass, in a moist heat.

A. edulis (edible). *fl.* cream-coloured, solitary or in fascicles, terminating the branches, almost sessile. June. *fr.* edible. *l.* opposite, leathery, oblong, acuminated, shining above, and bearded in the axils of the veins beneath. *h.* 12ft. Guiana, 1823.

ALICANT SODA. *See* **Salsola.**

ALISMA (from *alis*, the Celtic word for water). Water Plantain. SYN. *Actinocarpus.* ORD. *Alismaceæ.* A genus entirely composed of hardy aquatic species. Flowers three-petaled. Leaves parallel-veined. Increased by division or

FIG. 56. ALISMA NATANS.

seeds. The latter should be sown in a pot immersed in water, filled with loam, peat, and sand, and the former root freely in a moist loamy soil. The British species are most easily grown.

A. natans (floating).* *fl.* white; peduncles simple. July. *l.* elliptical-obtuse; stem ones floating, on long stalks, scarcely nerved;

Alisma—*continued.*

those at the base of the plant are long, linear-lanceolate, membranous scales, or abortive root leaves. North Wales and Cumberland, but very rare; abundant in other parts of Europe. See Fig. 56.

A. Plantago (plantain).* *fl.* delicate pale rose coloured; scape branched upwards. July. *l.* ovate, acute, all radical, on long stalks; branches all whorled, bracteated, compound. *h.* 2ft. to 3ft. Britain. A very handsome aquatic for naturalising. See Fig. 57.

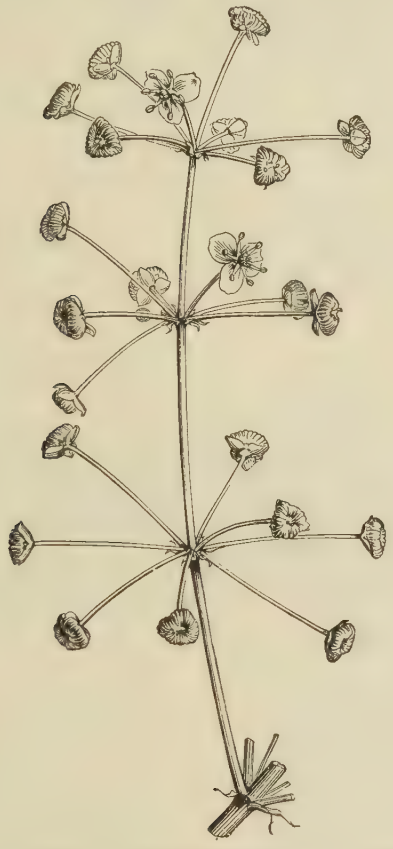


FIG. 57. PORTION OF INFLORESCENCE OF ALISMA PLANTAGO.

A. P. lanceolata (lance-shaped leaved). *fl.* pure white. July. *l.* lanceolate. Britain.

A. ranunculoides(Ranunculus-like). In general appearance very like the last named species, but smaller. Britain.

ALISMACEÆ. A small order of aquatic or marsh plants, with three-petaled flowers, on leafless scapes, and simple radical leaves. The genera best known are *Alisma* and *Sagittaria*.

ALKANET. *See* **Anchusa tinctoria.**

ALLAMANDA (named in memory of Dr. Allamand, of Leyden, who first communicated seeds of this genus to Linnæus). ORD. *Apocynaceæ.* Elegant climbing evergreen stove plants. Peduncles terminal and many-flowered; corolla funnel-shaped, with a narrow tube, gamopetalous, large, inflated, five-cleft at the apex. Leaves verticillate. This genus differs from all others of the same order, in the figure of the corolla. Of comparatively easy culture. To obtain their beauty of foliage and flowers, the shoots should be tied to wires placed within 8in. or 9in. of the glass that forms the roof of the structure in which the plants are growing. Trained in this way, and the shoots allowed to ramble in a somewhat natural manner, the effect, when the plants are in flower, is grander and more pleasing in every respect than when the shoots are tied to a formal

Allamanda—*continued.*

trellis, of whatever shape. When thoroughly established, they succeed admirably in a compost of three parts good fibry loam, and one part wood charcoal or coarse river sand, with some rotten cow manure added. When potting the plants, make the fresh compost firm round the old balls of soil, and do not fill the pots too full; leave room for plenty of water, as, when in active growth, they require a liberal daily supply. They must be pruned annually in January or February, cutting the previous year's shoots back to within a joint or two of the old wood. Allamandas should be exposed to the light as much as possible at all seasons of the year. In winter months they require but little water, but the drainage must always be perfect. They are remarkably free from insect attacks of any kind. It may be also observed that the temperature should never fall below 55deg. This genus is easily propagated by cuttings, which will root at any time of the year in a bottom heat of from 70deg. to 80deg. The usual time is, however, in spring, when the old plants are pruned back. Choose the tops of the shoots, retaining two or three joints to each cutting; place these in a compost of sand and peat or leaf mould in equal proportions, singly, in small pots. Press the soil firmly around each cutting, and, when all are inserted, give a good watering, and plunge the pots in the propagating bed. Attend to shading and watering, and in about three weeks' time they will have emitted roots, and started to grow at the tops. The pots should now be raised out of the plunging material, and placed upon the surface thereof, and there allowed to remain two or three weeks longer; when the young roots will have, by this time, filled the little pots, and a shift into the larger ones will be necessary. Return the plants to the propagating bed, but do not plunge them therein. As soon as it is certain that the roots have commenced growth in the fresh soil, pinch the point of each plant that is intended to be grown on a trellis. This will cause the remaining buds to push out fresh shoots; and these, as soon as they have made two joints or whorls of leaves each, should have their points pinched out also. By repotting the plants as often as they fill their pots with roots during the first season of their growth, and pinching the points out of the shoots twice or thrice in the same time, a good foundation will be formed, from which the future specimens will spring. In the case of plants intended to be trained up rafters or pillars, they should not have their points pinched out until they attain to the height where it is desirable they should have more than one shoot, and be repotted as recommended above, for the first year; but, after that, they will require to be repotted only once a year, and this should be done soon after the buds have started to grow afresh in the spring.

A. Aubletii (Aublet's).* *fl.* yellow, large. June. *l.* four to five in a whorl, broad-oblong, acuminated, rather hairy beneath. Guiana, 1848.

A. cathartica (purging).* *fl.* yellow, large. June. *l.* four in a whorl, obovate, obtuse, acutish, with sub-undulated edges, glabrous. Guiana, 1785. SYN. *A. Linnæi.*

A. chelsoni (Chelsea).* *fl.* yellow, large. Summer. This splendid plant is least suited of any for trellis training, from its wood being stiffer and harder, and is therefore best for the roof of a house; it is one of the best kinds for cutting. Garden hybrid.

A. grandiflora (large-flowered).* *fl.* distinct pale yellow, rather large, very free blossomer. June. Brazil, 1844.

A. Linnæi (Linnæus's). Synonymous with *A. cathartica.*

A. neriifolia (Oleander-leaved).* *fl.* deep golden yellow, elegantly streaked with orange, between funnel and bell shaped, the tube being wide, 1in. long; panicle many-flowered. June. *l.* oblong, on short petioles, acuminate. *h.* 3ft. South America, 1847. Shrub erect, glabrous.

A. nobilis (noble).* *fl.* bright yellow, rather deeper tinted in the throat, large, full circular form, but without streaks or any other markings. July. *l.* in whorls of four or of three, tapered to the base, sessile, oblong, abruptly acuminate, membranous, hairy on both surfaces, especially beneath and on the midrib. Brazil, 1867. One of the best species.

Allamanda—*continued.*

A. Schottii (Schott's).* *fl.* yellow, large, throat beautifully striped with rich brown. September. *l.* oblong, acuminated, four in a whorl, quite glabrous, on both surfaces. *h.* 10ft. Brazil, 1847. This species is a very strong grower, and suits the roof system best; it is also a very free blossomer.

A. verticillata (whorl-leaved). *fl.* yellow, large. June. *l.* usually six in a whorl, ovate-oblong, obtuse, quite glabrous. South America, 1812.

A. violacea (violet). *fl.* purple. Brazil, 1859.

ALLANTODIA (from *allantos*, a sausage; in reference to the cylindrical form of the indusium). ORD. *Filices.* A greenhouse monotypic genus, differing from *Asplenium* in the dehiscence of the involucre, and it may receive similar treatment to the Spleenworts. Sori dorsal, linear-oblong, attached to the primary veins. Involucre the same shape as the sorus and quite inclosing it, bursting in an irregular line down to the centre.

A. Brunoniana (Brown's).* *fronds* often 1ft. to 2ft. long, ½ft. to 1ft. broad; pinnæ 3in. to 6in. long, 1in. broad, entire. *sori* confined to the anterior vein of the first fork. Himalayas, up to 6000ft., &c. SYN. *Asplenium javanicum.*

ALLARDTIA. *See* **Tillandsia.**

ALLEYS. Small walks of various widths, but generally 1½ft. or 2ft. wide, and formed in right lines, parallel to the main walks, or borders, sometimes covered with a thin coat of sand, gravel, or shells, or paved with flints, pebbles, &c. Spaces left between beds of seedling plants are generally meant when alleys are referred to.

ALL-HEAL. *See* **Prunella vulgaris.**

ALLIACEOUS. Pertaining to the *Garlic* family.

ALLIARIA. *See* **Sisymbrium.**

ALLIGATOR APPLE. *See* **Anona palustris.**

ALLIGATOR PEAR. *See* **Persea gratissima.**

ALLIUM (from *all*, meaning hot or burning; in allusion to the well-known properties of the Onion tribe). Including *Porrum*, *Schœnoprasum*. ORD. *Liliaceæ*. Hardy bulbous plants, with flat or terete radical leaves, and capitate or umbellate flowers, enclosed in a membranous spathe at the summit of a slender, naked, or leafy scape; perianth spreading or campanulate. They are of very easy culture, increasing rapidly by offsets. The little bulbs, which are produced in clusters, may be separated and re-planted, in autumn or early spring, about 4in. deep. Seeds are also easily obtainable. These may be sown thinly in light soil, in February or March, where they should remain until the autumn or following spring, when they may be transplanted to their flowering situations. During the growing season, all the attention required will be to keep the plants free of weeds, and place stakes to the tall-growing kinds.

A. acuminatum (taper-pointed).* *fl.* deep rose, ¼in. to 1in. across, in many-flowered umbels. July and August. *l.* rather shorter than the stems, very narrow, only about a line wide. *h.* 6in. to 10in. North-West America, 1840.

A. a. rubrum (red). *fl.* deep red-purple; in other respects like the type. California.

A. ascalonicum (Eschallot). *fl.* purple; umbels globose; scape rounded. Summer. *l.* subulate. *h.* 9in. Palestine, 1546. For culture, *see* **Shallot.**

A. azureum (sky-blue.)* *fl.* deep sky-blue, with a dark line through the middle of each division; umbels dense, globular, longer than the spathes which envelop them before expanding. Summer. *l.* triangular, from 6in. to 12in. long. *h.* 1ft. to 2ft. Siberia, 1830. One of the handsomest species grown.

A. Bidwelliæ (Mrs. Bidwell's).* *fl.* bright rose, about ¼in. across, in few-flowered umbels. July. *l.* narrow, rather longer than the stem. *h.* 2in. to 3in. Sierra Nevada, 1880. A very charming little species for the rockery.

A. Breweri (Brewer's).* *fl.* deep rose, nearly or quite 1in. across, in few-flowered umbels. July. *l.* much longer than the flower-stem, ¼in. or more broad. *h.* 1in. to 3in. California, 1882.

A. Cepa (common Onion). *fl.* white; scape ventricose, longer than the leaves. June, July. *l.* fistular, rounded. *h.* 3ft. For culture, *see* **Onion.**

A. C. aggregatum. Aggregated, Tree, or Potato Onion. *See* **Onion.**

Allium—*continued.*

A. cœruleum (blue-flowered).* *fl.* blue, in large compact globular heads. June. *h.* 8in. Russia, 1840. Very distinct.

A. Douglasii (Douglas'). Synonymous with *A. unifolium.*

A. Erdelii (Erdel's). *fl.* white, keeled with green, in compact umbels. *h.* 6in. Palestine, 1879. A rare but pretty species, and should be planted in a warm position on the rockery.

A. falcifolium (sickle-leaved).* *fl.* pale rose, ¼in. to ⅜in. across, in few-flowered umbels. August. *l.* two in number, thick, broadly linear, falcate. *h.* 2in. to 3in. North-West America, 1880.

A. falciforme (sickle-formed). Probably a variety of *A. unifolium*, with pure white flowers, in several-flowered umbels. *h.* 6in. California, 1882.

A. flavum (golden). *fl.* yellow, bell-shaped, and somewhat drooping, in pretty umbels; scape leafy at the base. *l.* round, not hollow, flattish above the base. *h.* about 1ft. Italy, 1759. A slender species.

A. fragrans. *See* **Nothoscordum.**

A. karataviense (Karatavian). *fl.* white, in dense globose heads. May. *l.* very broad, flat, glaucous, sometimes variegated. *h.* 6in. Turkestan, 1878.

A. Macnabianum (MacNab's).* *fl.* deep magenta, a colour quite unique in this family, in large umbels. *l.* nearly as long as the stem, channelled, about ¼in. broad. *h.* 1ft. North America.

A. magicum (enchanting). Synonymous with *A. nigrum.*

FIG. 58. ALLIUM MOLY.

A. Moly (Moly).* *fl.* bright yellow, numerous, in compact umbels. Spring *l.* few, broadly lanceolate. Stem sub-cylindrical. *h.* 10in. to 15in. South Europe, 1604. A very old favourite; bright-flowered and very fine in masses. See Fig. 58.

A. Murrayanum (Murray's).* *fl.* rosy purple, in large heads. *l.* narrow, longer than the stem. *h.* 1ft. North America. A good variety of *A. acuminatum.*

A. mutabile (changeable). *fl.* white, changing to rose, in many-flowered umbels. July. *l.* shorter than the stem, narrow, channelled. *h.* 12in. to 24in. North America, 1824.

A. neapolitanum (Neapolitan).* *fl.* white, with green stamens, numerous, in a loose umbel, on stems exceeding the leaves in length; pedicels much longer than the flowers. Early summer. *l.* two or three, sheathing the flower stem, strap-shaped, about 1in. across. *h.* 15in. to 18in. South Europe, 1823. Probably the most ornamental white-flowered species.

A. nevadense (Sierra Nevada). *fl.* white, or pale rose, about ¼in. across, in several-flowered umbels. July. *l.* flat, rather longer than the stem, about ¼in. wide. *h.* 3in. to 6in. Sierra Nevada and Utah, 1882.

A. nigrum (blackish).* *fl.* dull violet, or whitish, with a green vein, very numerous, in a large umbel. Summer. *l.* thick, broadly lanceolate, acute, ciliated, toothed at the edges, at first erect and glaucescent, afterwards green and spreading, much shorter than the stem. *h.* 2½ft. to 3½ft. South of Europe. Very vigorous and free flowering. SYN. *A. magicum.*

A. paradoxum (wonderful). *fl.* white, gracefully pendulous, borne on long footstalks springing from little nests of yellow bulbils. Spring. *l.* one or two, as long as the scape, linear-lanceolate, acute, keeled, striated, smooth, ¼in. broad, drooping and recurved. *h.* 9in. to 14in. Siberia, 1823.

A. pedemontanum (Piedmont).* *fl.* rosy-purple, large, bell-shaped, in large, graceful drooping clusters. July. *l.* lanceolate, shorter than the stem. Piedmont, 1817. A neat little plant for rockwork, or warm border. One of the handsomest species grown.

A. reticulatum (netted). *fl.* varying from pink to white. Summer. *l.* narrow, or almost filiform, shorter than the stem. *h.* 9in. to 15in. North-West America, 1882. A rare species.

A. r. attenuifolium (attenuate-leaved).* This may be regarded as an extremely handsome white-flowered variety. North-West America.

Allium—*continued.*

A. roseum (rose-coloured).* *fl.* pale lilac-rose, large, in umbels of ten or twelve; stems round, rather longer than the leaves. Summer. *l.* strap-shaped, channelled, rolled inwards at the top, not hairy. *h.* 12in. to 16in. South Europe, 1752.

A. sativum (cultivated). Garlic. *fl.* white; umbel bulbiferous. Summer. *l.* flat. *h.* 1½ft. Sicily, 1548. For culture, *see* **Garlic.**

A. schœnoprasum (rush-leaved onion). Chives. *fl.* purple; umbel many-flowered, globose, without bulbils. June and July. *l.* cylindrical, somewhat tapering towards the point; stem with one leaf, or naked. *h.* 1ft. England. For cultivation, *see* **Chives.**

A. Scorodoprasum. Rocambole; Sand Leek. *fl.*, perianth ½in. long, the segments red-purple, with white margins; head loose flowered, with purple bulbils; scape slender. May to August *l.* 6in. to 8in. long, flat, keeled, the edges scabrid. *h.* 3ft. Europ (Britain), 1596. *See also* **Rocambole.**

A. sphærocephalum (globe-headed).* *fl.* densely packed in a subspherical head; in a bud state the upper ones are reddish-purple, the lower green. June. *l.* narrow, shorter than the long terete stems. *h.* 1½ft. to 2½ft. South Europe, 1759.

A. stramineum (straw-coloured). *fl.* yellow, in dense globular umbels. July. *l.* narrow, shorter than the stems. *h.* 1½ft. to 2ft. Siberia.

A. striatum (striated). *See* **Nothoscordum.**

A. triquetrum (three-cornered). *fl.* white, somewhat bell-shaped, with a narrow streak of pure green down each petal, in a loose, slightly drooping umbel, on erect triangular stems shorter than the leaves. Summer. *l.* green, broadly strap-shaped, keeled in a triangular manner, sometimes very long. *h.* 12in. to 18in. South Europe, 1789.

A. unifolium (one-leaved). *fl.* bright rose. July. *h.* 1ft. to 2ft. California, 1873. A handsome species, from California, resembling *A. roseum*, but differing from all known species by the circumstance that its bulbs are developed at a distance from each other, and are connected by a thread-like rhizome, ½in. to 1in. long. SYN. *A. Douglasii.*

A. ursinum (bear). Broad-leaved Garlic; Ramsons. *fl.* pure white, with acute perianth segments; umbel level at top; scape triangular. Summer. *l.* one or two, radical, ovate-lanceolate, stalked, large, bright green. *h.* 1ft. Britain. See Fig. 59.

FIG. 59. ALLIUM URSINUM.

A. validum (strong). *fl.* pure white or rose-coloured, in large, rather drooping umbels. Summer. *l.* ½in. to ¾in. broad, nearly as long as the stem. *h.* 12in. to 30in. Oregon and California, 1881. A pretty species.

A. Victorialis (Victoria's). *fl.* greenish-white, in many-flowered, spicate umbels. May. *l.* broadly ovate-oblong, channelled, shorter than the stem. *h.* 1½ft. to 2ft. Southern and Eastern Europe, 1739. Conspicuous from its broad leaves. Rare.

ALLOBROGIA. A synonym of **Paradisia** (which *see*).

ALLOCHLAMYS. A synonym of **Pleuropetalum** (which *see*).

ALLOPHYLLUS. A synonym of **Schmidelia** (which *see*).

ALLOPLECTUS (from *allos*, diverse, and *pleco*, to plait; the calyx appears as if it was plaited in diverse directions). ORD. *Gesneraceæ.* Very handsome stove evergreen shrubs. Corolla tubular or club-shaped, straightish; calyx coloured. Leaves opposite, one in each pair smaller than the other, petiolate, fleshy, scattered or decumbent, or erect, the under surface generally reddish; branches opposite. For cultivation, *see* **Gesnera.**

A. bicolor (two-coloured). *fl.* yellow, purple; corolla pilose; pedicels axillary, one-flowered. June. *l.* ovate, oblong, acuminate, denticulate, pilose above, downy beneath; branches tetragonal. *h.* 1ft. New Grenada, 1840. Plant erect, rather woody.

A. capitatus (headed). *fl.* capitate; sepals red, leafy; corolla silky, ventricose above the middle; peduncles axillary. March. *l.* large, ovate, serrated, downy, reddish beneath. Stem bluntly tetragonal, red. *h.* 2ft. South America, 1847.

A. dichrous (two-coloured). *fl.* purple, yellow, axillary, crowded, nearly sessile. *l.* ovate-lanceolate, quite entire, pubescent. Brazil, 1845. A climber.

Alloplectus—*continued.*

A. peltatus (peltate-leaved).* *fl.* whitish, about 2in. long, in axillary tufts. August. *l.* opposite, one is 1in. to 2in. long, and the other 6in. to 9in. long, and 2in. wide, oblong, shortly acuminate, rounded, peltate at the base, and raised on stout footstalks, 1in. to 2in. long. *h.* 1ft. Costa Rica, 1877.

A. repens (creeping). *fl.* yellow; corolla with curved tube, four lobed; sepals ovate, spotted; peduncles axillary, solitary. February. *l.* ovate, rather fleshy, serrate, on short petioles. St. Martha, 1845. Plant downy; an evergreen trailer.

A. vittatus (striped). *fl.*, calyx crimson; corolla pale yellow; terminal and fasciculate, surrounded by vivid red foliaceous bracts. *l.* large, shortly-stalked, broadly-ovate, of a deep velvety green, having a broad greyish-green band down the centre, branching off along the course of the principal veins. Stems erect, fleshy. Peru, 1870.

A. zamorensis (Zamora).* *fl.* yellow; sepals orange-red. *h.* 1ft. Columbia, 1875.

ALLOSORUS. *See* **Cryptogramme** and **Pellæa.**

ALLOTMENT GARDENS. A system of assigning small portions of land to be cultivated by labourers after their ordinary day's work.

The following are the most important rules to be carried out; but, should occasion arise, other rules must be made to meet particular cases:—

1. Each Allotment should consist of a rood of land (=¼ acre) to be let yearly at a rent of not more than 10s.

2. The Allotment to be let for one year only, to be re-let to the same occupier, provided his character has been satisfactory during the preceding year.

3. The rent shall be considered due at Michaelmas. If it remains unpaid for one month after that date, the Allotment shall be forfeited.

4. The Allotment to be cultivated solely by spade husbandry, and the same crop shall not be planted on the same part two years in succession.

5. Separate Allotments shall be divided by a space not less than 18in.

6. Any occupier trespassing on his neighbour's Allotment, or in any way interfering or damaging the same, shall not be allowed to hold his Allotment after the expiration of the year.

ALLSPICE. *See* **Calycanthus.**

ALLSPICE TREE. *See* **Pimenta.**

ALMEIDEA (in honour of J. R. P. de Almeida, a Brazilian, who was of great assistance to St. Hilaire while travelling in Brazil). ORD. *Rutaceæ.* Stove trees or shrubs with alternate, simple, entire, stalked leaves. Racemes terminal, divided at the apex into compound thyrse-like panicles. The undermentioned species will grow freely in a mixture of loam, sand, and peat. Partly ripened cuttings will root in sand under a hand glass, in heat.

A. rubra (red). *fl.* pink; petals very blunt; racemes compound. September. *l.* lanceolate, acute at base. *h.* 12ft. Brazil, 1849. Evergreen shrub.

ALMOND. *See* **Amygdalus.**

ALMOND-LEAVED WILLOW. *See* **Salix triandra.**

ALNUS (from *al*, near, and *lan*, the bank of a river; general habitat of the genus). The Alder Tree. ORD. *Betulaceæ.* A genus of deciduous trees and shrubs. Flowers monœcious; barren ones in long drooping autumnal catkins, lasting through the winter; fertile ones, produced in spring, in oval catkins, resembling a fir-cone in shape, the fleshy scales of which become indurated and ligneous as they approach maturity. Leaves stalked, roundish, blunt. Propagated usually by seeds, which are gathered towards the end of October; they require to be well dried, in order that the cones do not become mouldy. The seeds are sprinkled lightly on the ground with the slightest possible covering. Towards the end of the year, the seedlings will be about 10in. high. They are then planted in rows 1½ft. apart, and 6in. from each other, where they may remain for two years, after which they can be placed out in the situations where they are intended to stand. Planting is best done in November or March; and, if it is designed to make a plantation of

Alnus—*continued.*

Alder, the young trees should be put in holes, made with an ordinary garden spade, about 9in. deep, and about 4ft. apart. They are also increased, but rarely, by cuttings, by suckers, and by grafting.

A. cordifolia (heart-shaped-leaved).* *fl.* greenish-brown. March and April, before the development of the leaves. *l.* heart-shaped, acuminate, dark green, and shining. *h.* 15ft. to 50ft. Calabria and Naples, 1820. A large, very distinct, and handsome round-headed tree. It grows rapidly in dry soil, and is one of the most interesting of ornamental trees.

A. firma (firm).* *l.* oval lanceolate, acuminate, sharply serrated, many-nerved. Japan. One of the most distinct of all the Alders.

FIG. 60. ALNUS GLUTINOSA, showing Catkins and Fruit.

A. glutinosa (sticky)*. *barren catkins* long, large, and cylindrical, pendent, their footstalks branched. *fertile catkins* small, ovate, with deep red scales. Spring. *l.* roundish-cuneiform, obtuse lobed at the margin, and serrated, somewhat glutinous, downy in the axils of the nerves beneath. *h.* 50ft. to 60ft. Britain. The Alder affects moist and damp situations, and, as it grows quickly, it is a useful tree to plant in bare situations. It is valuable as a nurse to other trees by the sea-side. See Fig. 60.

A. g. aurea (golden).* Foliage golden colour.

A. g. incisa (incised).* Compact form, with leaves quite like those of common hawthorn. SYN. *A. g. oxyacanthifolia.*

A. g. laciniata (cut).* *l.* oblong and pinnatifid, with the lobes acute. This has elegant drooping branches and fern-like leaves, and is one of the best.

A. g. oxyacanthifolia (sharp-prickled). Synonymous with *A. g. incisa.*

A. g. quercifolia (oak-leaved).* *l.* with a sinuate outline, like that of the common oak. A very distinct form. The variety *imperialis* (= *asplenifolia*) slightly differs in its more or less lobed or cut foliage; *A. g. variegata* is a variegated form.

A. incana (hoary).* *l.* broadly oval or ovate, rounded at the base, sharply serrate, whitened, and mostly downy beneath. *h.* 8ft. to 20ft. North Temperate regions. This affects drier situations than our native *A. glutinosa.*

A. viridis (green). *fertile catkins* slender stalked, clustered, ovoid. *l.* round oval or slightly heart-shaped, glutinous and smooth or softly downy beneath, serrate, with very sharp and closely set teeth. Mountainous regions of northern hemisphere.

ALOCASIA (from *a*, without, and *Colocasia*). Allied to *Colocasia.* ORD. *Aroideæ.* Stove plants of great beauty, often with large and handsomely variegated, usually peltate, leaves, and shortly petiolate glaucous spathes. They are not difficult to grow, with a strong moist heat, and an abundant supply of water to the roots. The soil should

Alocasia—*continued.*

consist of fibrous peat, with a little light fibry loam, in large lumps; to this add a good proportion of sphagnum and lumps of charcoal, with plenty of silver sand. Keep the bulbs and soil raised well above the rim of the pots, and finish off with a surfacing of either sphagnum or cocoanut fibre. The latter will soon encourage new rootlets. Crock the pot quite two-thirds up with clean, broken potsherds. Water freely when in good growth, and give liquid manure once or twice a week through the growing season. Shade during bright sunshine in the spring and summer months. Increased by seeds and division of the stems or rhizome. Winter temperature, 60deg. to 65deg.; summer, 75deg. to 85deg. *See also* **Caladium** and **Colocasia.**

A. alba (white). *fl.* white. *h.* 1½ft. Java, 1854.

A. amabilis (lovely). Synonymous with *A. longiloba.*

A. chelsonii (Chelsea).* An interesting hybrid between *A. cuprea* and *A. longiloba.* *l.* large, upper surface deep green, glossy and metallic, under side purplish, as in *A. cuprea.*

A. cucullata (hood-leaved). *fl.* green, whitish. Spring. *h.* 2ft. India, 1826.

A. cuprea (coppery).* *fl.*, spathe purplish-red, with short lamina. *l.* cordate-ovate, peltate, deflexed, 12in. to 18in. long, rich bronze colour, purple beneath. *h.* 2ft. Borneo, 1860. SYNS. *A. metallica, Xanthosoma plumbea.*

A. gigantea (gigantic). Synonymous with *A. longiloba.*

A. guttata (spotted). *fl.*, spathe white, spotted with purple. *l.* leafstalk also spotted. *h.* 2½ft. Borneo, 1879.

A. hybrida (hybrid).* A cross between *A. Lowii* and *A. cuprea.* *l.* elliptic in outline, with a very short acuminate point, and very slightly parted at the base, deep olive-tinted green on the upper surface, having stout, well-defined ribs, and the margin of an ivory white; dull purple at the back.

A. illustris (bright). *l.* ovate-sagittate, rich green, with olive-black patches, deflexed, 1½ft. long. India, 1873.

A. Jenningsii (Jennings's).* *l.* peltate, cordate-ovate, acuminate, with their blades deflexed from the top of the erect mottled stalks, ground colour green, surface marked with large wedge-shaped blotches of dark brown; veins bright green, 6in. to 8in. long. India, 1867. A very distinct and free growing species.

A. Johnstoni (Johnston's).* *l.* semi-erect, arrow-shaped, peltate, the front lobe being about 12in. long, and the two back lobes 14in. long and divergent, olive-green, prettily variegated and strikingly veined with bright rosy red. The leafstalks are furnished at intervals with irregular whorls of stiff spines, the points of which are turned upwards. Stem darkly mottled with flesh-coloured bands just above the spines. Solomon Isles, 1875. This plant has quite a unique appearance.

A. Liervalii (Lierval's). *l.* bright green. Philippines, 1869.

A. longiloba (long-lobed). *l.* large, sagittate, with the upper part spreading out, green, with silvery veins. *h.* 4ft. Java, 1864. SYNS. *A. amabilis, A. gigantea.*

A. Lowii (Low's). *fl.*, spathe white. *l.* cordate-sagittate, 14in. to 16in. long, peltate, deflexed, olive-green, with thick white ribs, deep purple beneath. Borneo, 1862.

A. macrorhiza (long-rooted). *fl.* green, whitish. *h.* 5ft. Polynesia.

A. m. variegata (variegated). *l.* large, somewhat cordate, with slightly waved margins, bright green, blotched and marbled with white, sometimes nearly quite white; footstalks broadly streaked with pure white. Ceylon. A very striking and effective large growing plant.

A. Marshallii (Marshall's). *l.* green, with dark blotches, and broad central silvery band. India, 1811.

A. metallica (metallic). Synonymous with *A. cuprea.*

A. navicularis (boat-shaped spathe). *fl.*, spathe boat-shaped, whitish. *h.* 1ft. India, 1855.

A. Roezlii. *See* **Caladium marmoratum.**

A. scabriuscula (roughish).* *fl.*, spathe entirely white; limb 3in. long, oblong, cuspidate. *l.* spreading, not deflexed, sagittate, not in the least peltate, deep shining green above, pale green beneath, extreme length 22in. to 31in. *h.* 4ft. to 4½ft. North-West Borneo, 1878. Although this is not such an ornamental species as *A. Lowii, A. Thibautiana,* or *A. cuprea,* it has the merit of being a much larger and bolder plant than either of these, and is one of the largest species in the genus.

A. Sedeni (Seden's).* A hybrid between *A. Lowii* and *A. cuprea.* *l.* oval, cordate, sagittate, deflexed, bronzy green, purple beneath, veins distinct ivory white.

A. Thibautiana (Thibaut's).* *l.* ovate-acute, deeply cordate; basal lobes rounded and not sharply pointed, deep olive greyish-green, traversed by numerous grey veinlets branching from the midrib, which is greyish-white, purple beneath. Borneo, 1878. This is said to be by far the finest of the genus.

A. variegata (variegated). *fl.* whitish. *l.* leafstalk mottled with violet. India, 1854.

Alocasia—*continued.*

A. zebrina (zebra).* *l.* erect, broadly sagittate, rich dark green borne upon stout footstalks, which are pale green, mottled and striped with zigzag bands of dark green. *h.* 4ft. or more. Philippine Isles, 1862.

ALOE (from *Alloeh*, its Arabic name). Allied genera: *Apicra, Haworthia, Pachidendron, Phylloma.* Including *Rhipodendron.* ORD. *Liliaceæ.* This hitherto much confused genus, and its allies, have been completely revised by Mr. J. G. Baker (*vide* "Journal of the Linnean Society," vol. xxviii. pp. 152—182), to whose account we are indebted for many of the following particulars:—Plant with or without stems; shrubs or (rarely) trees; leaves thick, fleshy, frequently in a rosette; peduncles simple or racemed, endowed with few or many empty bracts. Flowers racemed; pedicels bracteated at base, solitary; perianth-tube straight or slightly recurved; segments elongated; stamens hypogynous, as long as the perianth, or longer. Mr. Baker describes over eighty species, many of which, for various and important reasons, have no claim upon our space. Natives of the Cape of Good Hope, except where otherwise stated. These very interesting and curious plants thrive well in a mixture of open loam and peat, together with a small quantity of well decomposed manure. If old brick rubbish, or any other similar material is mixed with the soil to ensure perfect and rapid drainage, so much the better. Water, especially during winter, must be carefully administered. They thrive in an ordinary greenhouse, and cannot have too much light at any time.

A. abyssinica (Abyssinian).* *fl.*, perianth twelve to fifteen lines long; raceme dense-oblong, 3in. to 4in. long, and 2in. to 3in. broad; lower pedicels nine to twelve lines long; peduncle branched, 1½ft. to 2ft. *l.* about twenty in a rosette, ensiform, 1½ft. to 2½ft. long, acuminate, green, sometimes spotted, five to six lines thick in middle; back rounded; marginal prickles distant, deltoid, one to two lines long. Stem simple, 1ft. to 2ft. long, 2in. to 3in. in diameter. Abyssinia, 1777. SYN. *A. maculata.*

A. a. Peacockii (Peacock's). This is a rare variety.

A. africana (African). *fl.*, perianth yellow, fifteen to eighteen lines long; racemes dense, 1ft. in length, 3in. in diameter; peduncle very strong, branched. *l.* in a dense rosette, ensiform, 1½ft. to 2ft. long, 2½in. to 3in. broad, slowly narrowing from base to the apex, channelled above the middle, where it is four to five lines thick; marginal prickles close, one and a half to two lines long. Stem simple, when fully grown, 20ft.

A. albispina (white-spined).* *fl.*, perianth red, 1½in. long; raceme dense, nearly 1ft. long, 4in. broad; lower pedicels fifteen to eighteen lines long; peduncles simple, 1½ft. *l.* loosely disposed, lanceolate, ascending, 6in. to 8in. long, 2in. broad, green, without spots or lines; face concave upwards; middle three to four lines thick; back sparingly tubercled; marginal prickles white, horny, two lines long. Stem simple, short, 1in. to 1½in. in diameter. 1796.

A. albocincta (white-banded).* *fl.*, perianth brilliant red, ten to twelve lines long; racemes twenty or more, shortly capitate, 2in. to 2½in. in diameter when expanded; pedicels ascending, six to nine lines long; scape stout, branched, 1½ft. to 2ft.; *l.* twelve to twenty in a dense rosette, outer ones recurved, lanceolate, 1½ft. to 2ft. long, 4in. to 6in. broad, glaucous, obscurely lined and spotted; middle three to four lines thick; margin red or white tinted. Stems in old specimens, 1ft. to 2ft. long, 3in. to 4in. in diameter. SYNS. *A. Hanburyana, A. paniculata,* and *A. striata.*

A. arborescens (tree-like).* *fl.*, perianth red, fifteen to eighteen lines long; raceme dense, about 1ft.; pedicels ascending, twelve to fifteen lines long; peduncles strong, 1½ft., simple or branched. *l.* (rosette 3ft. to 4ft. in diameter) dense, aggregate, ensiform, 1½ft. to 2ft.; base 2in. broad, thence to apex attenuated, acuminated, green, rather glaucous, without spots or lines; middle three to four lines long; base five to six lines thick; upper surface beyond the base channelled; marginal prickles close, one and a half to two lines long, horny. Stem simple, finally 10ft. to 12ft. long, 2in. to 3in. in diameter. 1700.

A. a. frutescens (shrubby). Dwarfer. *l.* often loose, and shorter, intensely glaucous; peduncle simple. Stem slender, sometimes racemosed.

A. aristata (awned). *fl.*, perianth red, fourteen to sixteen lines long; raceme simple, loose, 4in. to 6in. long, and about 4in. broad; pedicels sub-patent, thirteen to eighteen lines long; scape simple, 1ft. *l.* about fifty in a dense rosette, ascending, lanceolate, 3in. to 4in. long, six to eight lines broad, without spots or lines; face flat, sparingly tubercled; middle one and a half lines thick; back copiously tubercled; apex bearded with a pellucid awn; marginal teeth diffuse, white, half line long. 1824.

A. Bainesii (Baines').* *fl.*, perianth fifteen to sixteen lines long, yellowish red; raceme simple, dense, oblong, 3½in. to 4in. in diameter when expanded; pedicels thick, two to three lines long; peduncles upright, strong, eight to nine lines in diameter. *l.* closely

Aloe—*continued.*

packed at the top of the branch, ensiform, 1ft. to 1½ft. long, 2in. to 3in. in diameter, green, spotted, deeply channelled, recurved; middle two to three lines thick; marginal prickles pale, rather distant, one to one and a half lines long. Arborescent, branched. *h.* 40ft. to 60ft.; trunk 4ft. to 5ft. in diameter. SYNS. *A. Barberæ, A. Zeyheri.*

A. barbadensis (Barbadoes). Synonymous with *A. vera.*

A. Barberæ (Barber's). Synonymous with *A. Bainesii.*

A. brevifolia (short-leaved).* *fl.*, perianth red, fifteen to eighteen lines long; raceme dense, 6in., long, 2½in. to 3in. in diameter; pedicels upright, six to twelve lines long; peduncles simple, hardly 1ft. long. *l.* thirty to forty in a dense rosette, lanceolate, 3in. to 4in. long, and 1in. broad at the base, glaucous, without spots or lines; face unarmed, below swollen or flat; middle three to four lines thick; back convex, sparingly tubercled; marginal teeth, whitish, one to one and a half lines long. Stem short, simple. SYN. *A. prolifera.*

A. b. depressa (depressed). *fl.* somewhat larger; peduncles 1½ft. to 2ft. long. *l.* 6in. long; bottom 1½in. to 2in. broad; face sometimes sparingly tubercled.

A. cæsia (bluish-grey).* *fl.*, perianth red, fifteen to sixteen lines long; racemes dense, nearly 1ft. long, 2in. to 3in. in diameter; pedicels twelve to fifteen lines long; scape simple, 6in. *l.* rather dense, lanceolate acuminate, 1ft. to 1½ft.; bottom 2in. to 3in. broad, intensely glaucous, without spot or lines, slightly channelled upwards; middle 3in. to 4in. thick; marginal prickles red, one to one and a half lines long. Stem simple, finally, in old specimens, 12ft. to 14ft. 1815.

A. Candollei (De Candolle's). A mere form of *A. humilis.*

A. chinensis (Chinese). *fl.*, perianth yellow, 1in. long; raceme loose, simple, 6in. to 8in. long, and 2in. broad; pedicels one and a half to two lines long; peduncle simple, 6in. to 12in. *l.* fifteen to twenty in a dense rosette, ensiform, 9in. to 12in. long, 1½in. broad at the bottom, pale green, not lined; base nearly flat; middle three to four lines thick; upper surface channelled; marginal prickles distant, pale, one to one and a half lines long. Stem short, simple. China, 1817.

A. ciliata (ciliated).* *fl.*, perianth brilliant red, twelve to fifteen lines long; raceme simple, loose, 2in. to 4in. long; pedicels three to four lines long; peduncles slender, simple. *l.* linear, widely spreading, amplexicaul, green, 4in. to 6in. long; base six to nine lines broad, slowly narrowing towards the apex, without spots or lines; middle one line thick; marginal teeth minute, white. Stems long, sarmentose; branches three to four lines in diameter; internodes six to twelve lines long, obscurely striated with green. 1826.

A. Commelyni (Commelin's). A mere form of *A. mitræformis.*

A. consobrina (related). *fl.*, perianth yellowish red, twelve to fifteen lines long; raceme rather loose, oblong, cylindrical, 3in. to 4in. long, and 2in. in diameter; pedicels three to four lines long; scape 1½ft., slender, branched. *l.* loosely disposed, ensiform, 6in. to 8in. long, and 1in. broad, green, spotted white; face channelled; middle three lines thick; marginal prickles minute, brownish; rosette 10in. to 12in. (sometimes 2ft.) in diameter; upper leaves ascending; central ones spreading half open; lower ones deflexed. Stem 2ft., simple, 1in. in diameter. South Africa, 1845.

A. Cooperi (Cooper's).* *fl.*, perianth fifteen to eighteen lines long; raceme close, 3in. to 6in. long, and 3in. to 4in. in diameter; lower pedicels 1in. to 2in. long; scape simple, 1½ft. to 2ft. *l.* when mature, 8in. to 10in. long, distichous, falcate, lined; outer ones 1½ft. to 2ft., above the base six to eight lines broad, greenish, deeply channelled, sparingly spotted; middle one and a half to two lines thick; marginal teeth minute, close, white. Plant stemless. Natal, 1862. SYN. *A. Schmidtiana.*

A. dichotoma (two-branched).* Quiver-tree. *fl.*, perianth oblong, ten to twelve lines long; raceme loose, 2in. to 4in. long, and 2in. in diameter; pedicels three to four lines long; peduncles stout, branched. *l.* closely packed, at the top of the branch, lanceolate, 8in. to 12in. long; bottom twelve to fifteen lines broad, glaucous, without spots or lines, slightly channelled above the base; middle three to four lines thick, narrow-margined with white; marginal prickles minute, pale. Trunk short, sometimes 3ft. to 4ft. in diameter. *h.* 20ft. to 30ft. 1781. Arborescent, branched.

A. distans (distant).* *fl.*, perianth pale red, fifteen to eighteen lines long; raceme densely capitate, 3in. to 4in. in diameter; lower pedicels twelve to fifteen lines long; peduncles 1½ft., usually simple. *l.* ascending, loosely disposed, ovate-lanceolate, 3in. to 5in. long, and 1½in. to 2in. broad, green, slightly glaucous, without spots and lines; face concave; middle three to four lines thick; back sparingly tubercled; marginal prickles close, white, horny, one to one and a half lines long. Stem short, simple, 1in. in diameter; internodes pale, striated green. 1732.

A. glauca (milky-green).* *fl.*, perianth pale red, fifteen to sixteen lines long; peduncles simple, 1ft. to 1½ft. long, 3½in. to 4in. in diameter; pedicels 1in. to 1½in. long. *l.* thirty to forty in a dense rosette, lanceolate, 6in. to 8in. long; at the base 1½in. to 2in. broad, slowly narrowing towards the apex, intensely glaucous, spotless, obscurely lined; middle three to four lines thick; face above the base slightly concave; back tubercled at apex; marginal teeth spreading, brownish, one to one and a half lines long. Stem simple, at length, about 1ft., 1½in. to 2in. in diameter. 1731.

Aloe—*continued.*

A. gracilis (graceful). *fl.*, perianth yellow, straight, fourteen to sixteen lines long; raceme densely packed, simple, 2in. to 3in.; pedicels three to four lines long; peduncle simple, 6in. to 9in. long, two-edged at the base. *l.* loosely disposed, spreading, 6in. to 10in. long; base ten to twelve lines broad, ensiform, acuminated, glaucous, spotless and without lines; face slightly channelled; back rounded; marginal prickles close, minute. Stem leafy, simple. 1822.

A. Greenii (Green's).* *fl.*, perianth pale red, fourteen to fifteen lines long; raceme oblong, 4in. to 8in. long, and 3in. in diameter; lower pedicels five to six lines long; scape 2ft. long *l.* in a dense rosette, lanceolate, 15in. to 18in. long; bottom 2½in. to 3in. broad, slowly narrowing from middle to the apex; middle three to four lines thick; face flat, shining green, obscurely lined and spotted white; marginal prickles spreading, one and a half to two lines long, horny. Stem short, simple, 1½in. in diameter. South Africa, 1875.

A. Hanburyana (Hanbury's). Synonymous with *A. albocincta.*

A. humilis (humble).* *fl.*, perianth brilliant red, eighteen lines long; raceme loose, simple, 6in. long, and 2in. to 2½in. in diameter; pedicels nine to twelve lines long; peduncles about 1ft. *l.* thirty to forty in a dense rosette, ascending, lanceolate, acuminate, 3in. to 4in. long, six to eight lines broad, glaucous green, obscurely lined; face slightly concave above, sparingly tubercled; middle three lines thick; back convex; marginal prickles pale, one line long. Plant stemless. 1731.

A. h. acuminata (taper-pointed). *l.* ovate-lanceolate, 4in. to 5in. long, fifteen to eighteen lines broad; marginal prickles pale, two to two and a half lines long. *A. incurva*, *A. suberecta*, and *A. subtuberculata*, of Haworth; *A. Candollei*, and *A. macilenta*, of Baker, are mere forms of the foregoing species.

A. incurva (incurved). A mere form of *A. humilis.*

A. latifolia (broad-leaved).* *fl.*, perianth brilliant golden scarlet, fifteen to eighteen lines long; raceme dense, corymbose, terminal, 4in. to 5in. long and wide; lower pedicels 1½in. to 2in. long; peduncle robust, 2ft., often branched. *l.* twelve to twenty in a dense rosette, ovate-lanceolate, 6in. long, 2½in. to 3½in. broad at bottom, slowly narrowing from below the middle upwards, green, not lined, but copiously spotted white; middle three to four lines thick; marginal prickles one and a half to two lines long, horny, brownish. Stem at length, 1ft. to 2ft., 1½in. to 2in. in diameter, simple. 1795.

A. lineata (line-marked).* *fl.*, perianth red, fifteen to eighteen lines long; raceme dense, 6in.; pedicels hardly perpendicular, fifteen to eighteen lines long; scape simple, 1ft. *l.* in a dense rosette, lanceolate, 6in. long, 2in. broad at base, narrowing slowly from thence to the apex, pale green, spotless, lined; middle three lines thick, channelled upwards on both sides, unarmed; marginal teeth numerous, red, one and a half to two lines long. Stem finally 6in. to 1ft., simple, 2in. in diameter. 1789.

A. macilenta (thin). A mere form of *A. humilis.*

A. macracantha (long-spined). *fl.* unknown. *l.* fifteen to twenty in a dense rosette, lanceolate, 15in. to 20in. long, and 3in. to 4in. broad at the bottom, slightly narrowed from middle to apex; middle four lines thick; face flat, green, obscurely lined, spotted; marginal prickles horny, three to four lines long. Stem simple, 2ft. to 3ft., 1½in. to 2in. in diameter. South Africa, 1862.

A. macrocarpa (large-fruited).* *fl.*, perianth club-shaped, brilliant red, fifteen to sixteen lines long; raceme loose, terminal, 6in. long, and 2½in. to 3in. in diameter; lower pedicels ½in. long; peduncles 2ft. *l.* twelve to twenty in a dense rosette, ovate-lanceolate, less than 1ft. long; bottom 3in. to 4in. broad; top channelled; middle three to four lines thick, green, copiously spotted; marginal prickles spreading, half line long. Stem short, simple. Abyssinia, 1870.

A. maculata (spotted). Synonymous with *A. abyssinica.*

A. margaritifera (pearl-bearing). *See* **Haworthia margaritifera.**

A. mitræformis (mitre-shaped).* *fl.*, perianth brilliant red, eighteen to twenty-one lines long; raceme dense, corymbose, 4in. to 6in. long, and nearly as much in diameter; pedicels ascending; lower ones fifteen to eighteen lines long; peduncles strong, 1½ft., sometimes branched. *l.* rather loosely disposed, ascending, lanceolate, about 1ft. long, 2in. to 3in. broad; green, slightly glaucous, without spots or lines; face concave; middle three to four lines thick; back convex, sparingly tubercled; apex horny, pungent; marginal prickles rather close, pale, one to one and a half lines long. Stem finally 3ft. to 4ft., simple, 1in. to 2in. in diameter.

A. m. flavispina (yellow-spined). Differs from the type in having narrower and more lanceolate leaves, and yellow spines. *A. Commelyni*, *A. spinulosa*, *A. pachyphylla*, and *A. xanthacantha*, are also forms of this species.

A. myriacantha (many-spined). *fl.*, perianth pale red, eight to nine lines long; racemes densely capitate, 2in. in diameter; pedicels four to six lines long; peduncles slender, simple, 1ft. *l.* ten to twelve, falcate, linear, 5in. to 6in. long, four to five lines broad, green, glaucous; face deeply channelled; back convex, spotted white; marginal teeth numerous, white. Plant stemless. 1823.

A. nobilis (noble).* *fl.*, perianth red, fifteen to eighteen lines long; raceme dense, 6 or more inches long, 4in. broad; lower pedicels

Aloe—*continued.*

1½in. to 2in. long; peduncles simple, 1½ft. *l.* rather loosely disposed, lanceolate, 9in. to 12in. long, 2½in. to 4in. broad; face green, without spots or lines, concave above the base; middle three to four lines thick; apex rather pungent; back prickly upwards; marginal prickles rather close, one and a half to two lines long, horny. Stem simple, at length 3ft. to 4ft. high, 1½in. to 2in. in diameter. 1800.

A. pachyphylla (thick-leaved). A mere form of *A. mitræformis.*

A. paniculata (panicled). Synonymous with *A. albocincta.*

A. Perryi (Perry's).* *fl.*, perianth greenish, nine to ten lines long; raceme dense, 3in. to 4in. long; pedicels three to four lines long; inflorescence 1½ft. long, commonly two-headed. *l.* in a rosette, lanceolate, 7in. to 8in. long, and 2½in. broad, from below the middle to the apex narrowed, pale glaucous green, spotless, obscurely lined, channelled above the base; middle three to four lines thick; marginal teeth close, horny, one line long. Stem simple, 1in. in diameter. Socotra, 1879.

A. prolifera (proliferous). Synonymous with *A. brevifolia.*

A. purpurascens (purplish). *fl.*, perianth reddish, twelve to fifteen lines long; raceme dense, 6in. to 9in. long, and about 3in. in diameter; pedicels nine to twelve lines long; scape strong, simple, 1½ft. to 2ft. *l.* forty to fifty in a dense rosette, 1ft. to 1½ft. long, ensiform, 2in. broad at the base, slowly narrowed towards the apex, green; base flat; middle three lines thick, slightly channelled upwards, sometimes spotted; marginal prickles small, white. Stem 2ft. to 3ft., sometimes forked. 1789.

A. rhodocincta (red-margined), of gardens, is probably a form of *A. albocincta.*

A. saponaria (soapy).* *fl.*, perianth brilliant red, eighteen to twenty-one lines long; raceme dense, corymbose, 3in. to 4in. long and wide; lower pedicels 1½in. to 2in. long; scape 1ft. to 2ft., simple, or sparingly branched. *l.* twelve to twenty in a dense rosette, lanceolate, 9in. to 12in. long, eighteen to twenty-four lines broad, narrowed from below the middle upwards; middle three to four lines broad; face flat at bottom; back swollen, green, copiously spotted, distinctly lined; marginal prickles adjoining, horny, one and a half to two lines long. Stem short, simple, 1½in. to 2in. in diameter. 1727.

A. Schimperi (Schimper's).* *fl.*, perianth bright red, eighteen to twenty-one lines long; racemes densely corymbose, 4in. in diameter; pedicels twelve to fifteen lines long; scape strong, 3ft. long, strongly branched above. *l.* twenty in a dense rosette, oblong-lanceolate, about 1ft. long, 4in. broad, glaucous green, lined, sometimes spotted, three to four lines thick at middle, above which they are channelled; teeth minute, spreading. Stem short, simple. Abyssinia, 1876.

A. Schmidtiana (Schmidt's). Synonymous with *A. Cooperi.*

A. serra (saw). *fl.*, perianth brilliant red, eighteen lines long; raceme simple, dense, 6in. long or more, 3in. to 4in. in diameter; pedicels six to twelve lines long; scape simple, 1½ft. to 2ft. *l.* thirty to forty in a dense rosette, lanceolate, 3in. to 5in. long, twelve to eighteen lines broad below, without spots and lines; base swollen, concave towards the apex; middle three to four lines thick, sparingly tubercled; marginal prickles close, one to one and a half lines long. Plant shortly stemmed. 1818.

A. serratula (finely-toothed).* *fl.*, perianth red, fifteen to eighteen lines long; raceme rather dense, 6in. long; pedicels six to nine lines long; peduncles simple, about 1ft. *l.* twelve to twenty in a dense rosette, lanceolate, 6in. to 9in. long; bottom 1½in. to 2½in. broad, pale green; face below the top flat or slightly concave, obscurely lined, spotted; margin minutely denticulated. Stem simple, finally 1ft. to 2ft. high, 1½in. to 2in. in diameter. 1789.

A. spinulosa (spiny). A mere form of *A. mitræformis.*

A. striata (striated). Synonymous with *A. albocincta.*

A. striatula (slightly striped).* *fl.*, perianth yellow, twelve to fifteen lines long; raceme oblong, rather dense, simple, 3in. to 6in. long, and 2in. in diameter; pedicels short; peduncles simple, nearly 1ft. *l.* linear, spreading, green, 6in. to 9in. long; base not dilated, six to eight lines broad, above the base upwards narrowed, slightly channelled; middle one line thick; marginal prickles deltoid. Stem long, sarmentose; floral branches three to six lines in diameter; internodes 6in. to 12in. long. 1823.

A. suberecta (slightly erect). A mere form of *A. humilis.*

A. subtuberculata (slightly knobbed). A mere form of *A. humilis.*

A. succotrina (Socotrine).* *fl.*, perianth reddish, fifteen lines long; raceme dense, about 1ft. long, 2½in. to 3in. in diameter; lower pedicels nine to twelve lines long; peduncles simple, 1½ft. *l.* thirty to forty in a dense rosette, ensiform, acuminate, falcate, 1½ft. to 2ft. long; base 2in.; middle 1in. broad, green, slightly glaucous, sometimes spotted, slightly channelled upwards; marginal prickles pale, one line long. Stem 3ft. to 5ft., often forked. Isle of Socotra. 1731.

A. tenuior (thinned). *fl.*, perianth pale yellow, five to six lines long; racemes rather loose, simple, oblong, nearly 1ft. 2in. in diameter; pedicels three to four lines long; peduncles slender, simple, 4in. to 8in. *l.* loose, linear, 5in. to 8in. long, slowly narrowing from middle towards apex, green, spotless, slightly channelled; middle one line thick; marginal prickles minute, pale. Stem long, sarmentose. 1821.

Aloe—*continued.*

A. tricolor (three-coloured).* *fl.*, perianth coral red, fleshy; raceme loose, oblong, 3in. to 4in. long, and 2in. broad; pedicels ascending, three to four lines long; scape 1½ft. long, glaucous purple; panicle deltoid. *l.* twelve to sixteen in a close rosette, lanceolate, 5in. to 6in. long, 1½in. to 2in. broad at bottom, slowly narrowing from below the middle to apex; middle five to six lines thick; back rounded; face slightly swollen, copiously spotted, not lined; marginal prickles close, spreading, about one line long. Stem short, simple. South Africa, 1875.

A. variegata (variegated).* *fl.*, perianth reddish, fifteen to sixteen lines long; raceme simple, loose, 3in. to 4in. long and about 3in. in diameter; pedicels three to four lines long; scape simple, tapering, 6in. to 8in. *l.* close, erecto-patent, lanceolate, 4in. to 5in. long, 1in. broad; face concave; back keeled, bright green, copiously spotted grey on both sides; margin whitish, denticulated. 1790. This is the variegated Aloe so frequently seen in cottage windows.

FIG. 61. ALOE VERA.

A. vera (true).* *fl.*, perianth yellow, cylindrical, ⅜in. to 1in. long; raceme dense, 6in. to 12in. long; scape strong, 2ft. to 3ft. long, simple or branched. *l.* ensiform, dense, aggregate, 2in. to 4in. broad, narrowing from the base to apex, pale green; middle about ½in. thick; face channelled above the base; marginal prickles subdistant, deltoid, horny. Stem rarely more than 1ft. or 2ft. 1596. SYNS. *A. barbadensis*, *A. vulgaris*. See Fig. 61.

A. vulgaris (common). Synonymous with *A. vera*.

A. xanthacantha (yellow-spined). A mere form of *A. mitræformis*.

A. Zeyheri (Zeyher's). A garden synonym of *A. Bainesii*.

ALOMIA (from *a*, not, and *loma*, a fringe). ORD. *Compositæ*. Allied to *Eupatorium*. An ornamental half-hardy evergreen plant. Grows freely in sandy loam, and may be propagated by cuttings.

A. ageratoides (ageratum-like). *fl.-heads* white, many flowered; involucrum campanulate, imbricate; scales narrow, acute; receptable naked, convex. July. *l.* opposite, or upper ones alternate, petiolate, denticulated. *h.* 1½ft. New Spain, 1824.

ALONA (primitive name, *Nolana*—letters transposed; from *nola*, a little bell, in allusion to the shape of the flowers). ORD. *Nolanaceæ*. A genus of pretty evergreen shrubs closely allied to *Nolana*, but differing principally in having several ovaries from one to six-celled, whereas *Nolana* has five four-celled ovaries. Leaves fasciculate; stems woody. They require ordinary greenhouse treatment, in a peat and loam compost. Cuttings root freely in sandy loam, with a very gentle bottom heat, in about a fortnight.

A. cœlestis (sky-blue).* *fl.* pale blue, very large, axillary, solitary; peduncle elongated. July. *l.* terete, fascicled; plant nearly glabrous. *h.* 2ft. Chili, 1843. This pretty species is an excellent one for growing out-of-doors during summer months.

ALONSOA (in honour of Z. Alonso, formerly Spanish secretary for Santa Fe de Bogota). ORD. *Scrophularineæ*. A genus of very pretty little half-hardy shrubs, herbaceous perennials, or annuals, with axillary, sub-racemose flowers, which are resupinate, with a sub-rotate five-cleft limb. Leaves opposite, or ternately whorled. They will grow freely in light rich soil; and are readily increased by cuttings in August or March, which should be placed in sandy soil in gentle heat, or by seeds sown in March. The herbaceous species may be treated as outdoor summer annuals, and should be raised in a little heat, and planted out early in May.

A. albiflora (white-flowered).* *fl.* pure white, with yellow eye, in long terminal spikes. *h.* 1½ft. to 2ft. Mexico, 1877. This is recommended for pot culture, as in the conservatory it will provide a succession of flowers throughout the autumn and winter.

A. caulialata (wing-stemmed). *fl.* scarlet, racemose. June. *l.* ovate, acute, serrated. Stems and branches quadrangular, winged. *h.* 1ft. Peru, 1823. Half-hardy, herbaceous.

A. incisifolia (cut-leaved).* *fl.* scarlet; peduncles long, alternate, disposed in terminal racemes. May to October. *l.* opposite, ovate, acute, deeply toothed, or serrate. *h.* 1ft. to 2ft. Chili, 1795. Glabrous greenhouse shrub. SYN. *Hemimeris urticifolia*.

A. linearis (linear-leaved). *fl.* scarlet, with a dark bottom, like most of the species. May to October. *l.* opposite, or three in a whorl, linear, entire or remotely denticulated; young leaves fascicled in the axils of the old ones. *h.* 1ft. to 2ft. Peru, 1790. Greenhouse shrub. SYN. *Hemimeris coccinea*.

A. linifolia (flax-leaved).* *fl.* scarlet. *h.* 1ft. to 1½ft. New Holland. This is an elegant little annual, forming symmetrical, graceful, and very free flowering plants, either for pot or out-door culture.

A. Matthewsii (Matthew's). *fl.* scarlet, in loose, terminal racemes. July. *l.* lanceolate, toothed, about 1in. long. Stem slender, quadrangular. *h.* 1ft. Peru, 1871. Greenhouse shrub.

A. myrtifolia (myrtle-leaved). *fl.* scarlet, very large. New and pretty species.

A. Warscewiczii (Warscewicz's).* *fl.* rosy scarlet. *h.* 1½ft. Chili, 1858. This is probably a herbaceous variety of *A. incisifolia*, and one of the best annuals.

ALOYSIA (in honour of Maria Louisa, mother of Ferdinand VII., King of Spain). Sweet-scented Verbena. ORD. *Verbenaceæ*. This genus is nearly allied to *Verbena*, which *see* for generic characters. A greenhouse deciduous shrub, with a very fine perfume and graceful habit. The most satisfactory plan of culture is to obtain well-grown thrifty young plants in spring, and grow them on for the season. As the wood ripens, give less water until they are at rest, when it must be nearly withheld. About the end of January, bring into the light and warmth, and water thoroughly. As soon as the plants break, cut back to three or four eyes; and when the young shoots are about an inch long, transfer into rich sandy soil, using pots a size or two smaller than those they were in before. When the pots are full of roots, transfer to those that are to hold the plants for the season. By this mode of culture, good plants are to be maintained for any length of time. Aloysias form excellent pillar subjects for either a cold greenhouse, or out-of-doors, in which latter situation they thrive remarkably well, but require thorough protection, with straw bands or mats, from November until March, and afterwards at night, until danger from severe frosts has passed. They require no summer training, their young growth being continually cut off for the many purposes of decoration to which they are applied, and to which they are so well adapted. They are easily increased by young cuttings in spring, which should be placed in sandy soil and gentle heat, when they will root in about three weeks.

Aloysia—*continued.*

A. citriodora (lemon-scented).* *fl.* whitish or lilac, very small, in terminal panicles. August. *l.* pale green, lanceolate, agreeably scented, arranged in whorls of threes; branches slender. Chili, 1781. SYNS. *Lippia citriodora, Verbena triphylla.*

ALPINE GARDEN. A very interesting style of gardening, which succeeds best by imitating Nature as closely as possible. The situation may be an open or a sheltered one. In building a Rock or Alpine Garden, it should be so arranged that all aspects are secured—shady and sunny—fully or in degree only. Pockets and crevices of various sizes may be made, and filled with soil suitable for the subjects to be planted therein, each one having a direct connection with the bulk of the soil; and the constructing material should be arranged with a gentle fall, so that moisture drains towards rather than from the roots. Alpine plants, as a rule, flourish better on a properly constructed rockery than if placed in any other position, because thorough drainage is effected, and the long and fine roots can run down in the crevices, where the soil is cool and moist. Although most alpine plants are naturally exposed to the full action of sun and wind, they should be placed out in early autumn, or early spring, so as to become thoroughly established before the approach of scorching summer weather. Failing materials necessary for the construction of a rockery, many alpines are easily grown in the ordinary border, in a naturally or artificially well drained situation. Excavate to the depth of 18in., put in a layer of stones, broken bricks, &c., 6in. deep; fill up with rich fibrous loam and leaf mould, adding sufficient sand to keep the soil porous. When the desired subjects are firmly planted, cover the surface with small gravel or stone chippings, which, while allowing the rain to penetrate the soil, effectually checks evaporation, and keeps it moist and cool, as well as giving the appearance of rocky *débris*. The effect will be better if the surface is slightly undulated.

ALPINE ROSE. *See* **Rhododendron ferrugineum.**

ALPINIA (in honour of Prosper Alpinus, an Italian botanist). ORD. *Zingiberaceæ*. A rather large genus of stove herbaceous perennials, with considerable grace and beauty. Flowers disposed in terminal spikes. Leaves lanceolate, smooth, even, entire, sheathed at the base, and having transverse veins. Roots fleshy, branched, having much of the smell and taste of ginger. The soil can hardly be too rich for the successful culture of these plants. A mixture of equal parts loam, peat, leaf mould, or thoroughly rotted hotbed manure, freely mixed with sharp sand or fine charcoal dust, forms an excellent compost. During the growing season, a top dressing of rotten dung, and a frequent application of weak manure water, prove excellent stimulants. They grow rapidly and consume a great deal of food in the production of so much stem and so many leaves. Unless the former is vigorous and of considerable thickness, it will fail to be crowned with spikes of flower. Alpinias require a high temperature, a rich, light soil, abundance of water, and not a little space, to grow them well. Soon after flowering, the plants will assume the yellow leaf, when water may be gradually withheld; but no attempt should be made to dry them off too severely, even after the stems die down. Nor must they be stored when at rest in a low temperature; in fact, they require as much heat to preserve them in health when resting as at any other time. The best time to divide the plants is after the young shoots have made an inch of growth in spring.

A. albo-lineata (white-lined).* *l.* elliptic lanceolate, pale green, marked with oblique broad bands of white. *h.* 3ft. to 4ft. New Guinea, 1880.

A. mutica (beardless). *fl.* in pairs on a spike-like raceme; calyx white; corolla duplex, consisting of three outer oblong white segments; upper lobe concave and projecting, broad; lip large, bright yellow, veined with crimson; mouth finely crispulate at the edge. Borneo, 1882. A very handsome species.

A. nutans (nodding).* *fl.* pink, sweetly-scented; racemes drooping. May. *l.* lanceolate, smooth, even, entire. *h.* 15ft. India, 1792. This species looks best in considerable masses, even larger than those shown in the illustration, grown in large pots or tubs, or

Alpinia—*continued.*

planted out in borders of tropical houses. It should on no account be severely divided. See Fig. 62.

FIG. 62. ALPINIA NUTANS, showing Habit and detached Flower.

A. vittata (striped).* *l.* 6in. to 8in. long, elliptic lanceolate, tapering to a long fine point, and also narrowed gradually towards the sheathing base, pale green, marked by broad stripes of dark green and creamy white, running off from the midrib in divergent lines, corresponding to the venation. South Sea Islands. See Fig. 63, for which we are indebted to Mr. Bull.

ALSIKE. *See* **Trifolium hybridum.**

ALSODEIA (from *alsodes*, leafy; plants thickly beset with leaves). ORD. *Violarieæ*. Ornamental evergreen stove shrubs. Flowers small, whitish, racemose; petals equal; racemes axillary and terminal; pedicels bracteate jointed. Leaves usually alternate, feather-nerved; stipules small, deciduous. They thrive best in a mixture of loam and sand, and young cuttings root readily under a bell glass if planted in sand, in heat.

A. latifolia (broad-leaved).* *fl.* on dense, glabrous racemes. *l.* ovate, obtusely acuminated. *h.* 6ft. Madagascar, 1823.

A. paucifiora (few-flowered). *fl.* few, somewhat corymbose; pedicels reflexed. *l.* wedge-shaped, on short footstalks. *h.* 4ft. Madagascar, 1824.

ALSOPHILA (from *alsos*, a grove, and *phileo*, to love; in reference to the situation which they affect in Nature). ORD. *Filices*. A magnificent genus of tropical and temperate tree ferns. Sori globose, dorsal, on a vein or in the forking of a vein; receptacle mostly elevated, frequently villous; involucre none. The species of this genus require an abundant supply of water, particularly in summer, and the young fronds must be carefully shaded from solar heat. They thrive well in a peat and loam compost. For general culture, *see* **Ferns.**

A. aculeata (prickly).* *fronds* ample, tripinnate. *rachises* brown-stramineous; pinnæ ovate-lanceolate, 1ft. to 1½ft. long; pinnules sessile, ligulate, 3in. to 4in. long, ½in. to ¾in. broad; segments close, ligulate, blunt, denticulate, often less than one line broad:

Alsophila—*continued.*

both sides bright green, slightly hairy on the ribs, not scaly. *sori* minute, medial; texture herbaceous. Tropical America; very common. * A very effective stove species. SYN. *A. ferox*, &c. See Fig. 64.

A. armata (armed).* *fronds* ample, tripinnatifid or tripinnate. *rachises* stramineous, densely pilose; pinnæ oblong-lanceolate, 1½ft. to 2ft. long; pinnules ligulate-lanceolate, sessile, 3in. to 5in. long, ⅔in to 1in. broad; segments falcate, blunt, one to one and a half lines broad, subentire or toothed; both sides densely pilose on the ribs, not scaly. *sori* subcostular. Tropical America, extremely abundant. Stove species.

Alsophila—*continued.*

or less villous on the costæ and costule above, and very minutely bullato-paleaceous beneath, often quite naked, from 6ft. to 30ft. long; primary pinnæ 1½ft. long, 6in. to 10in. wide; pinnules 3in. to 4in. long, ⅓in. to ¾in. wide, oblong, acuminate, deeply pinnatifid, or towards the base even pinnate; ultimate pinnules or lobes oblong, acute, serrated, subfalcate. *sori* copious, rather small. New Holland, &c., 1833. A very handsome greenhouse species.

A. comosa (hairy). Synonymous with *A. Scottiana.*

A. contaminans (contaminating).* *cau.* slender, growing from 20ft. to 50ft. high. *sti.* and *rachises* purplish brown, glossy, aculeate. *fronds* 6ft. to 10ft. long, ample, glabrous, deep green above, glau

FIG. 63. ALPINIA VITTATA.

A. aspera (rough).* *cau.* slender, 10ft. to 30ft. high. *sti.* and *rachises* strongly aculeated; main and partial rachis above strigillose, slightly scaly beneath and on the costa, the rest glabrous, often glossy. *fronds* bipinnate; pinnules shortly petiolate, oblong; apex acuminated, pinnatifid half or two-thirds of the way down to the costa; lobes oblong-ovate, often acutely serrulate; costa bearing small, deciduous, bullate scales beneath. *sori* very deciduous. West Indies, &c. Stove species.

A. australis (southern).* *sti.* with very long, firm, subulate scales, 1½ft. long, and as well as the main rachises, muricato-asperous, stramineous. *fronds* ample, subglaucous beneath, more cous beneath; primary pinnæ 2ft. or more in length, oblong-ovate, acuminate; pinnules sessile, 4in. to 5in. long, ½in. to 1in. wide, deeply pinnatifid, linear-oblong, sub-falcate, entire. *sori* nearer the costule than the margin. Java and Malaya. Stove species. SYN. *A. glauca.*

A. Cooperi (Cooper's).* *fronds* ample, tripinnate. *rachises* stramineous, muricated, glabrous beneath; basal scales large, linear, pale, spreading; pinnæ oblong-lanceolate, 1½ft. to 2ft. long; pinnules ligulate, 4in. to 5in. long, ⅔in. to 1in. broad, lowest long-stalked; segments ligulate, blunt, toothed, one and a half to two and a half lines broad. *sori* small. Queensland, &c. Greenhouse.

Alsophila—*continued.*

A. excelsa (tall).* *trunk* about 30ft. high. *sti.* and main *rachises* muricated. *fronds* ample, dark green above, paler beneath; primary pinnæ 1½ft. to 2ft. long, 6in. to 10in. wide; pinnules numerous, oblong-lanceolate, acuminated, deeply pinnatifid, often quite pinnate; ultimate divisions ¼in. to ½in. long, oblong, acute or obtuse, falcate, the margins sub-recurved, serrated. *sori* copious near the costules. Norfolk Island. This rapid-growing and splendid species proves nearly hardy in the neighbourhood of Cornwall; and is a most effective plant for sub-tropical gardening purposes generally. Greenhouse species.

A. ferox (fierce). Synonymous with *A. aculeata.*

A. Gardneri (Gardner's). Synonymous with *A. paleolata.*

A. gigantea (gigantic). *cau.* growing from 20ft. to 40ft. high. *sti.* asperous; *fronds*, primary pinnæ 1½ft. to 2ft. and more long, deeply pinnatifid at the apex; pinnules, upper ones sessile, lower ones petiolate, oblong-acuminate, 3in. to 6in. long, five to nine lines wide, deeply pinnatifid; lobes triangular or rounded, serrated. *sori* copious. India, &c. Stove species. SYN. *A. glabra.*

A. glabra (glabrous). Synonymous with *A. gigantea.*

A. glauca (grey). Synonymous with *A. contaminans.*

A. infesta (troublesome). *fronds* ample, tripinnatifid; pinnæ oblong-lanceolate, 1ft. to 1½ft. long; pinnules ligulate, 3in. long, ½in. to 1in. broad, cut down to a narrow wing; segments ¼in. broad, ligulate, blunt, nearly entire; texture sub-coriaceous; colour deep green on both sides. Tropical America; widely distributed. Stove species.

A. Leichardtiana (Leichardt's).* *cau.* 10ft. to 20ft. high. *sti.* jointed upon the caudex; main and secondary rachises purple, deciduously powdery, spiny. *fronds* 6ft. to 10ft. long, firm, dark green above, sub-glaucous beneath, naked and glaucous (or nearly so), tripinnate; primary pinnæ 1½ft. to 2ft. long, 8in. wide, oblong-lanceolate, acuminate; pinnules oblong-acuminate, sessile, pinnatifid only at the apex; ultimate divisions linear-oblong, acute, spinulose-serrate. *sori* copious, close to the costa. Australia, 1867. Greenhouse species. SYNS. *A. Macarthurii, A. Moorei.*

A. lunulata (moon-shaped pinnuled). *fronds* ample, tripinnate. *rachises* stramineous, glabrous below, densely muricated; pinnæ oblong-lanceolate, 1½ft. to 2ft. long; pinnules close, ligulate, sessile, 4in. to 5in. long, ¾in. to 1in. broad; segments close, ligulate, falcate, blunt, one line broad, obscurely crenulate. *sori* minute. *h.* 25ft. Polynesia. Greenhouse species.

A. Macarthurii (MacArthur's). Synonymous with *A. Leichardtiana.*

A. Moorei (Moore's). Synonymous with *A. Leichardtiana.*

A. paleolata (scaly).* *cau.* slender, 10ft. to 20ft. high. *fronds* ample, tripinnatifid. *rachises* stramineous, smooth, pubescent below; pinnæ oblong-lanceolate, 1½ft. to 2ft. long; pinnules ligulate, sessile or shortly stalked, 3in. to 4in. long, ¾in. to ¾in. broad, deeply cut, the segments blunt and nearly entire; texture sub-coriaceous; colour deep green, both surfaces deeply pilose, the lower scaly on the ribs. *sori* large, medial. Columbia, &c. Stove species. SYN. *A. Gardneri.*

A. procera (tall). *sti.* aculeated and paleaceous below, with large glossy, dark brown scales. *fronds* bipinnate, glabrous, pinnatifid at the apex; primary pinnæ 1ft. or more long, the rachis winged above; pinnules 2in. to 3in. long, oblong-acuminate or obtuse, pinnatifid half way down to the costa; lobes short, sub-rotundate, often acute, mostly entire. *sori* small on all the lobes, between the costule and the margin. Tropical America. Stove species.

A. pruinata (as if hoar-frosted).* *sti.* densely woolly at the base. *fronds* glaucous, bi-tripinnate; primary pinnæ petiolate, 12in. to 18in. long, ovate-lanceolate; pinnules 3in. to 4in. long, 1in. wide, petiolulate, from a broad base, oblong-acuminate, deeply pinnatifid, or again pinnate; ultimate divisions ¼in. long, lanceolate, very acute, deeply and sharply serrated. *sori* solitary. Tropical America, extending to Chili. Stove or greenhouse species.

A. radens (rasping). *cau.* 3ft. high, 3in. diameter. *sti.* 2ft. to 3ft. long, clothed with ovate, pale brown scales. *fronds* 6ft. to 8ft. long, lanceolate-ovate, bipinnatisect; primary segments 1½ft. long, elongato-oblong, acuminate; secondary ones 2in. to 3in. long, petiolulate, linear-lanceolate, pinnati-partite; segments oblong, denticulate. *sori* between the costule and the margin. Brazil. Stove species.

A. Rebeccæ (Rebecca's).* *cau.* slender, 8ft. high. *fronds* ample, bipinnate; pinnules twenty to thirty on each side, the lower ones stalked, linear, 2in. to 3in. long, more or less incisocrenate, apex acuminate. *sori* principally in two rows between the midrib and edge. Queensland. Greenhouse species. See Fig. 65, for which we are indebted to Mr. Bull.

Alsophila—*continued.*

A. sagittifolia (arrow-leaved).* *fronds* oblong-deltoid, 4ft. to 6ft. long, bipinnate. *rachises* stramineous, muricated; pinnæ lanceolate, ¾ft. to 1ft. long, the lower shorter, deflexed; pinnules sessile, ligulate, crenulate, cordate on both sides at the base, 1in. to 1½in. long, nearly ¼in. broad. *sori* large. Trinidad, 1872. Very handsome and distinct stove species.

A. Scottiana (Scott's).* *fronds* ample, tripinnatifid. *rachises* castaneous, naked and smooth beneath; pinnæ oblong-lanceolate,

FIG. 64. ALSOPHILA ACULEATA.

1½ft. to 2ft. long; pinnules sessile, 3in. to 4in. long, about ½in. broad, ligulate, cut down to a narrow wing on the rachis; segments ligulate, blunt, dentate, sub-falcate, not ½in. broad. *sori* sub-costular. Sikkim, 1872. Greenhouse species. SYN. *A. comosa.*

A. Tænitis (Tænitis-like).* *fronds* 3ft. to 6ft. long, bipinnate; pinnules distant, 3in. to 5in. long, lanceolate, acuminate, glabrous, sub-entire, petioled; petiole articulated on the rachis. *sori* in a single series, equidistant between the costa and the margin, mixed with long, copious hairs. Brazil. An elegant stove species.

A. villosa (villous).* *cau.* 6ft. to 12ft. high. *sti.* 1ft. or more long, tubercular, densely clothed at the base with ferruginous scales. *fronds* from 6ft. to 8ft. long, bi- or sub-tripinnate, broadly lanceolate in outline; pinnules 1in. to 3in. long, oblong-lanceolate, obtusely acuminate, deeply pinnatifid; lobes oblong, obtuse, entire or coarsely serrated. *sori* copious. Tropical America. A very beautiful stove species.

ALSTONIA (in honour of Dr. Alston, once Professor of Botany at Edinburgh). ORD. *Apocynaceæ.* Usually tall, lactescent, or milk-bearing stove evergreen shrubs or trees, with small white flowers, which are disposed in terminal cymes. Leaves entire, opposite or often whorled. Of easy culture, thriving best in a mixture of peat, loam, and sand. Cuttings root readily in sand, in heat. Besides the one mentioned, there are eleven other species.

A. scholaris (school). *fl.*, corolla salver-shaped, white; cymes on short peduncles. March to May. *l.* five to seven in a whorl, obovate-oblong, obtuse, ribbed; upper surface glossy, under white, and having the veins approximating the margin. *h.* 8ft. India, 1803. SYN. *Echites scholaris.*

ALSTRÖMERIA (in honour of Baron Alströmer, a Swedish botanist, friend of Linnæus). ORD. *Amaryllideæ* Tall handsome stove, half-hardy, or hardy tuberous-rooted plants, with leafy stems and terminal umbels of richly-coloured flowers. Perianth regular, six-parted, subcam-

Alstromeria—*continued.*

panulate; inner segments narrower, two of which are somewhat tubulose at the base; stamens included within, and inserted with perianth; stigma trifid. Leaves linear, lanceolate, or ovate, and resupinate, or inverted in position by the twisting of the petiole. Cultivation: Few plants need less attention to grow them successfully, either in pots or planted out. The best position for those kinds which succeed outside is a deep and dry, sloping, sheltered border, in a compost of two-parts peat and leaf soil, and one loam with some sharp sand. Water freely if severe drought sets in; a surface covering of common moss, or cut fern in winter, will prove an advantage. They are very effective in masses. Propagation: They may be increased by seed or root division. Sow the former when ripe, or in early spring, thinly in pans, pots, or boxes, and place in a cool house or frame, so that they will receive some fostering in their early stages. The seedlings should be pricked out singly, when large enough to handle, and grown on till well established under glass. A mixture of peat, leaf mould, and sandy loam, is the best compost in which to sow the seeds and grow the young plants. When sufficiently established, they may be placed in a warm sheltered spot outside, and about 1ft. apart. The fasciculated masses of

Alstromeria—*continued.*

fleshy roots are readily separated into as many pieces as there are crowns; this operation may be performed during September or October, or February and March; but it must be done carefully. Except for the sake of increase, the less they are disturbed the better. They are excellent subjects for pot culture (some can only be managed thus, unless planted out in a house), and may be potted as early in the autumn as possible, in 8in., 10in., or 12in. pots. Thorough drainage is essential; arrange the crocks carefully, and place a layer of thin turfy loam over them. A compost of equal parts turfy loam, leaf mould, and fibrous peat, with an abundance of sand, will suit them admirably. Water sparingly at first, but when root-action is fully resumed, they must never be allowed to get dry. Support the stems by staking when they require it, and just previous to flowering, top-dress with some rotten manure and leaf soil. Occasional syringings will be necessary to keep down red spider, especially if the atmosphere is very dry. As the plants finish flowering, and the leaves fade, gradually diminish the supply of water until the stems are quite down, when they may be placed somewhere out of the way, free from frost, for the winter, but not kept dry enough to make them shrivel. In repotting, as much of

FIG. 65. ALSOPHILA REBECCÆ.

Alströmeria—*continued.*

the old soil as is practicable should be removed, without seriously disturbing the roots, and the plants shifted into larger or the same sized pots, according to their condition. Alströmerias were at one time much more largely grown than they are at present, and the genus was represented in nearly every garden.

FIG. 66. ALSTRÖMERIA AURANTIACA, showing Habit and Flower.

A. aurantiaca (golden).* *fl.* orange; two upper perianth segments lanceolate, streaked with red; arranged in a five to six stalked umbel, bearing ten to fifteen blooms. Summer and autumn. *l.* numerous, linear-elliptical, obtuse, glaucous, twisted and turned back at the base, about 4½in. long. *h.* 3ft. to 4ft. Chili, 1831. A variable but very showy species, quite hardy. See Fig. 66.

A. caryophyllæa (clove-like scent).* *fl.* scarlet; very fragrant, perianth two-lipped; peduncles longer than the involucre. February and March. *l.* spathulate-oblong. Stem erect. *h.* 8in. to 12in. Brazil, 1776. This stove species requires perfect rest in winter. SYN. *A. Ligtu.*

FIG. 67. INFLORESCENCE OF ALSTRÖMERIA PELEGRINA.

A. chilensis (Chilian).* *fl.* blood-red or pink, large, the two upper interior petals longer and narrower, variegated with yellow lines; in pairs on a five to six stalked umbel. Summer and autumn. *l.* scattered, obovate, spathulate; upper ones lanceolate, twisted at the base, minutely fringed on the edges, glaucescent. *h.* 2ft. to 3ft. Chili, 1849. Hardy. There are many varieties of this species, varying in colour from a rosy white to a deep orange or red.

A. densiflora (thickly-flowered).* *fl.*, perianth scarlet, dotted with black spots inside towards the base; umbels many-flowered, dense; pedicels pubescent, rarely bracteated. *l.* alternate, ovate, shortly acuminate, pubescent underneath. Stem climbing, glabrous. Peru, 1865. Tender species.

Alstromeria—*continued.*

A. Flos Martini (St. Martin's flower). Synonymous with *A. pulchra.*

A. Hookeri (Hooker's). Synonymous with *A. Simsii.*

A. Ligtu (Ligtu). Synonymous with *A. caryophyllæa.*

A. Pelegrina (the native name).* *fl.* white, or pale yellow, striped with rose, and yellow spot on each segment; pedicels one-flowered, on a six or more stalked umbel. Summer. *l.* lanceolate, twisted at the base. *h.* 1ft. Chili, 1754. Rather tender. See Fig. 67.

A. p. alba (white).* Lily of the Incas. *fl.* white. Perhaps this is the most chaste of all the Alströmerias, and more tender than many others; it should have a specially warm spot, or the protection of glass. 1877.

A. peruviana (Peruvian). Synonymous with *A. versicolor.*

A. psittacina (parrot-like).* *fl.* bright crimson at the base, greenish upwards, spotted with purple; upper perianth segments slightly hooded, hence the specific name; umbels many-flowered; peduncles angular. September. *l.* oblong-lanceolate, acute, twisted at the base. Stem erect, spotted. *h.* 6ft. Mexico, 1829. Hardy.

A. p. Erembaulti (Erembault's). *fl.* white, spotted with purple. August. *h.* 2ft. 1833. A beautiful but rather tender hybrid.

A. pulchella (pretty). Synonymous with *A. Simsii.*

A. pulchra (fair).* St. Martin's Flower. *fl.* in umbels of from four to eight in each; the lower perianth segments purplish outside, and edges of a sulphur-white; the upper part of the upper segments of a fine yellow, dotted with deep red spots, the lower part of a flesh colour; pedicels twisted. *l.* linear lanceolate. Stem erect. *h.* 1ft. Chili, 1822. A beautiful species, but one requiring protection. SYNS. *A. Flos Martini, A. tricolor.*

A. rosea (rosy). A synonym of *A. Simsii.*

A. Simsii (Sims's).* *fl.* brilliant yellow, with red streaks, very showy; umbels many-flowered; peduncles two-flowered. June. *l.* spathulate, ciliated. Stem weak. *h.* 3ft. Chili, 1822. Hardy species. SYNS. *A. Hookeri, A. pulchella, A. rosea.*

A. tricolor (three-coloured). A synonym of *A. pulchra.*

FIG. 68. ALSTRÖMERIA VERSICOLOR, showing Habit and Flower.

A. versicolor (various coloured).* *fl.* yellow, with purple marks; lowest segment the broadest; umbel of usually three shortly-stalked blooms, very floriferous. Late summer. *l.* linear-lanceolate, sessile, scattered. *h.* 2ft. to 4ft. Peru, 1831. This is a very robust species, with several beautiful varieties, which are both easily obtained and very cheap. SYN. *A. peruviana.* See Fig. 68.

A. v. niveo-marginata (snowy-margined).* *fl.* rose, crimson and white, with green tips and black spots. *l.* lanceolate, stalked, white-edged. 1875. A charming but scarce variety.

ALTERNANTHERA (in allusion to the anthers being alternately barren). ORD. *Amarantaceæ.* Well-known ornamental-leaved half-hardy plants, with inconspicuous flowers in axillary heads. Some of the undermentioned species and varieties belong, technically speaking, to *Telanthera,* in which genus the five stamens are inseparate below, and alternate with as many sterile filaments. They are so universally known in gardening under the present generic name, that we have here included them for convenience' sake. Where Alternantheras are used in large quantities (and if they are to be used effectively, a considerable number must be provided), their economical propagation becomes a matter of importance. A good colour can only be secured by growing them in

Alternanthera—*continued.*

some house or pit in the full light and warmth of the sun; for, unless so grown, green or badly coloured plants will be the result. The best and quickest way of producing this class of plants in large quantities, is to make up a special hotbed for them about the end of March or beginning of April. If a pit be used, it should be filled up within 6in. of the glass with leaves and manure, or any other material that will produce a steady bottom heat of 80deg. or 85deg., and will last for three weeks or so at that point; which, at this season, will be an easy matter. When the heat has become regular and steady, about 4in. or 5in. of light, rich, sandy soil should be placed all over the surface, adding, at the same time, a sprinkling of silver sand on the top, and pressing it moderately firm with a flat board. The cuttings may now be prepared and dibbled in, 1in. apart each way. If kept close, moist, and shaded from bright sunshine, in a few days they will be forming roots, and so soon as that takes place the shading should be discontinued, and the ventilation gradually increased until they are finally hardened off and planted out. If carefully lifted, and placed in trays or baskets, with a rhubarb leaf over them, they may be taken any distance, and planted without flagging; with this advantage—that the plants being in good colour, the beds are effective at once. April is early enough to commence striking them, and these will be fit to plant out by the middle of June. The several species quoted in various dictionaries hitherto are unknown in English gardens.

A. amabilis (lovely).* *l.* elliptic, acuminate, greenish in some stages, with the principal ribs stained with red, but under free growth becoming almost entirely suffused with rose colour, mixed with orange, the midribs continuing to be of a deep red hue. Brazil, 1868.

A. a. amœna (charming).* *l.* small, spathulate, orange red and purple in colour, which is shaded with deep green and bronze. Brazil, 1865. A most elegant little plant, with a spreading habit.

A. a. tricolor (three-coloured).* *l.* broadly ovate, glabrous, dark green at the edge, and have a centre of vivid rose, traversed by purple veins, an irregular band of orange yellow intervening between the centre and margin. Brazil, 1862.

A. Bettzichiana (Bettzich's). *l.* olive and red. Brazil, 1862.

A. B. spathulata (spathulate-leaved). *l.* spathulate, but more elongated than the others; the principal colours are reddish pink and light brown; these are shaded with bronze and green. Brazil, 1865. A rather tall species.

A. ficoidea (fig-like).* *l.* variegated with green, rose, and red. India, 1865.

A. paronychioides (Paronychia-like).* *l.* narrow spathulate, ground colour deep orange red, beautifully shaded with olive green. Dense and compact grower, forming a little clump about 4in. high.

A. p. magnifica (magnificent).* A very fine variety, with a much higher colour than the type.

A. p. major (greater).* *l.* bronze, with rich orange tips; very effective.

A. p. m. aurea (greater-golden).* *l.* bright golden yellow, which colour they retain all through the season.

A. versicolor (various-colour).* *l.* medium sized, ovate, bright rosy pink and crimson, shaded with bronzy green, branching freely, and making a compact and handsome plant. Brazil, 1865.

ALTERNATE. Placed on opposite sides of an axis on a different line, as in alternate leaves.

ALTHÆA (from *altheo*, to cure; in reference to the medicinal qualities of some of the species). Marsh Mallow. Ord. *Malvaceæ*. Hardy biennials or perennials, closely allied to *Malva*. Outer calyx six to nine-cleft, inner one five-cleft. Most species belonging to this genus are worthy of cultivation, particularly in woods, coppices, and shrubberies; they will thrive in almost any kind of soil. They may be either increased by dividing the plants at the roots, or by seeds; the biennial species must be raised from seed every year, which may be sown in spring where they are intended to remain, or in pans placed in a cold frame, from which the young plants may be removed when large enough.

A. cannabina (Hemp-leaved).* *fl.* rose-coloured; peduncles axillary, many-flowered, loose, longer than the leaves. June. *l.* pubescent, lower ones palmately-parted, upper ones three-parted; lobes narrow, and grossly toothed. *h.* 5ft. to 6ft. South France, 1597. Perennial.

Althæa—*continued.*

A. caribæa (Caribean).* *fl.* rose coloured, with a yellow base, solitary, almost sessile. March. *l.* cordate, roundish, lobed, crenate-serrated. Stem straight, hispid. *h.* 3ft. Caribbee Islands, 1816. Biennial.

A. ficifolia (fig-leaved). Antwerp Hollyhock. *fl.* generally yellow or orange coloured, in terminal spikes, large, single or double. June. *l.* divided beyond the middle into seven lobes; lobes oblong, obtuse, irregularly toothed. *h.* 6ft. Siberia, 1597. Biennial.

A. flexuosa (zigzag).* *fl.* scarlet, axillary, solitary, stalked; petals obcordate. June. *l.* cordate, somewhat seven-lobed, obtuse, on long footstalks. *h.* 2ft. to 3ft. North India, 1803. Perennial.

A. frutex (shrubby). Synonymous with *Hibiscus syriacus*.

A. narbonensis (Narbonne).* *fl.* pale red; peduncles many-flowered, loose, longer than the leaves. August. *l.* pubescent, lower ones five or seven-lobed, upper ones three-lobed. *h.* 3ft. to 6ft. France, 1780. Perennial.

Fig. 69. Flower and Buds of Althæa officinalis.

A. officinalis (officinal). Common Marsh Mallow. *fl.* of a delicate, uniform blush colour; peduncles axillary, many-flowered, much shorter than the leaves. July. *l.* clothed with soft, white tomentum on both surfaces, cordate or ovate, toothed, undivided, or somewhat five-lobed. *h.* 3ft. to 4ft. Marshes, Britain. Perennial. See Fig. 69.

A. rosea (rose).* Hollyhock. *fl.* rose-coloured, large, axillary, sessile, somewhat spiked at the top. July. *l.* cordate, with five or seven angles, crenated, rough. Stem straight, hairy. *h.* 8ft. China, 1573. For special culture and varieties, *see* **Hollyhock.**

A. striata (streaked). *fl.* white, 2½in. in diameter, solitary, on short pedicels; calyx striped. July. *l.* cordate, bluntly three-lobed, crenated. Stem puberulous, and somewhat scabrous. *h.* 5ft. Biennial.

ALUMINOUS. Pertaining to, or containing alum, or alumina; as Aluminous soils.

ALUM-ROOT. *See* **Heuchera.**

ALYSSUM (from *a*, not, and *lyssa*, rage; in reference to a fable that the plant allayed anger). Madwort. Including *Psilonema*, *Ptilotrichum*, *Schivereckia*. Ord. *Cruciferæ*. Annuals or dwarf, branching, shrubby perennials, often clothed with hoary, stellate hairs. Flowers small, cruciform, white or yellow. Leaves distant, or the radical ones tufted, usually entire. Several of the species are very much alike. They are excellent plants for the rockery, or for the front of borders, growing freely in common but well-drained garden soil. They may be increased by cuttings, by division of the roots, or by seed. The cuttings should be made from young shoots, 2in. to 3in. in length, inserted in sandy loam, early in the season, in a

Alyssum—*continued.*

shady place. Seed may be raised outside, or in a frame in pans in sandy soil, most of them germinating in two or three weeks.

A. alpestre (alpine).* *fl.* yellow; raceme simple. June. *l.* obovate, hoary. Stem rather shrubby at the base, diffuse, greyish. *h.* 3in. South Europe, 1777. Perennial. A very neat little tufted species. *A. argenteum* (silvery), *A. Bertolonii* (Bertoloni's), and *A. murale* (wall), are larger growing species allied to the above, but of less cultural merit.

FIG. 70. ALYSSUM SAXATILE.

A. a. obtusifolium (obtuse-leaved). *fl.* yellow, corymbose. June. *l.* obovate-spathulate, blunt, silvery on the under surface. *h.* 3in. Tauria, 1828. A rare alpine.

FIG. 71. ALYSSUM SAXATILE VARIEGATUM, showing Habit, detached Shoot, and Inflorescence.

A. atlanticum (Atlantic). *fl.* yellow; raceme simple. June. *l.* lanceolate, hoary, and pilose. Stems shrubby at the base, erect. *h.* 6in. to 1ft. South Europe, 1820. *A. Marschallianum* is intermediate between *A. alpestre* and *A. a. obtusifolium*, but is seldom met with under cultivation.

A. gemonense (German).* *fl.* yellow, in close corymbs. April to June. *l.* lanceolate, entire, greyish-velvety from stellate down. Stem shrubby at the base. *h.* 1ft. Italy, 1710. Closely allied to *A. saxatile*, but not so hardy; it is very desirable for rockeries.

A. macrocarpum (large-fruited). *fl.* white, racemose. June. *l.* oblong, blunt, silvery. Stem shrubby, branched, somewhat spiny. *h.* 8in. South of France, 1828. *A. spinosa* (thorny), and *A. halimifolia* (purslane-leaved), are very like this species. *A. dasycarpum* (thick-fruited) is an annual with yellow flowers.

A. maritimum. *See* **Koeniga.**

A. montanum (mountain). *fl.* yellow, sweet-scented; raceme simple. May to July. *l.* somewhat hoary; lower ones obovate; upper ones oblong. Stems rather herbaceous, diffuse, pubescent. *h.* 2in. or 3in. Europe, 1713. A distinct and charming species for the rockery, forming compact tufts of slightly glaucous green. *A. cuneifolium* (wedge-leaved), *A. diffusum* (diffuse), and *A. Wulfenianum* (Wulfenius') come close to this species, the latter being the most desirable.

A. olympicum (Olympian). *fl.* deep yellow, small, in roundish corymbose heads. Summer. *l.* spathulate, sessile, very small, greyish. *h.* 2in. to 3in. Northern Greece.

A. orientale (Oriental).* *fl.* yellow, corymbose. May. *l.* lanceolate, repandly-toothed, waved, downy. Stems suffruticose at the base. *h.* 1ft. Crete, 1820. There is a variety with variegated leaves.

A. saxatile (rock).* *fl.* yellow, in close corymbose heads. April. *l.* lanceolate, entire, clothed with hoary tomentum. Stems shrubby at the base. *h.* 1ft. Eastern Europe, 1710. A very common and showy spring plant. See Fig. 70.

FIG. 72. INFLORESCENCE OF AMARANTUS CAUDATUS.

A. s. variegatum (variegated).* A constant and prettily variegated form, which is even more handsome than the type. On the rockery it does well, as it requires a sunny, well drained, position. See Fig. 71.

Alyssum—*continued.*

A. serpyllifolium (Thyme-leaved).* *fl.* pale yellow, in simple racemes. April to June. *l.* very small, ¼in. to ½in. long, ovate, scabrous, hoary. *h.* 3in. to 4in. Branches spreading, sub-woody at the base. South Europe, 1822.

A. tortuosum (twisted). *fl.* yellow; raceme corymbose. June. *l.* hoary, somewhat lanceolate. Stem shrubby at the base, twisted, diffuse. *h.* 6in. Hungary, 1804.

A. Wiersbeckii (Wiersbeck's).* *fl.* deep yellow, in close corymbose heads, about 1½in. across. Summer. *l.* 2in. long, oval-oblong-pointed, sessile, attenuated at the base, roughish and hairy. Stems erect, scabrous, simple, rigid. *h.* 1½ft. Asia Minor.

AMARANTACEÆ. An extensive order of herbs or (rarely) shrubs, with opposite or alternate leaves, and inconspicuous apetalous flowers, which are spicately or capitately disposed. The majority of this order are weeds; well-known exceptions being many species of *Amarantus.*

AMARANTH, GLOBE. *See* **Gomphrena.**

FIG. 73. INFLORESCENCE OF AMARANTUS HYPOCHONDRIACUS.

AMARANTUS (from *a*, not, and *maraino*, to wither; in reference to the length of time some of the flowers retain their colour). ORD. *Amarantaceæ.* Hardy or half-hardy annuals, with alternate entire leaves and small green or red flowers in large bracteate clustered spikes. Flowers polygamous, furnished with three bracts

Amarantus—*continued.*

at the base of a three or five-lobed glabrous perianth. Stamens four or five. Of very easy culture; they thrive best in rich loamy soil, and are largely employed for sub-tropical and other bedding, for vases and conservatory decorations, being very ornamental. The seed should be sown in April in a hotbed, and the plants thinned out in the same situation when about ½in. high. About the end of May, they can be transplanted out of doors in their permanent situations. They are also very handsome when grown in pots. The young plants should be potted off early, and freely encouraged, allowing plenty of pot-room and moisture, and be kept near the glass, to bring out their brightest colouring. To develop their full beauty, plenty of room is required. There are about twelve species (indigenous to warm and tropical countries).

A. bicolor (two-coloured). *l.* green, variously streaked with light yellow. *h.* 2ft. India, 1802. This species is rather delicate, and must have a warm sunny situation.

A. b. ruber (red).* *l.* brilliant glistening scarlet, merging into a dark violet red, mixed with green. Hardier than the type.

A. caudatus (caudate).* Love Lies Bleeding. *fl.* dark purplish, collected in numerous whorls, which are disposed in handsome drooping spikes. August. *h.* 2ft. to 3ft. India, 1596. A very common and vigorous growing hardy annual. There is a yellowish-flowered variety, which, though less ornamental, is an effective contrast. See Fig. 72.

A. cruentus (dark bloody). Synonymous with *A. hypochondriacus.*

A. Henderi (Hender's). *l.* lanceolate, undulated, intense rosy carmine, varying with orange buff, golden yellow, and olive green. *h.* 3ft. A garden hybrid, closely allied to *A. salicifolius.* Pyramidal habit.

A. hypochondriacus (hypochondriac).* Prince's Feather. *fl.* deep crimson, on densely packed, erect spikes. July. *l.* purplish beneath. *h.* 4ft. to 5ft. Asiatic, 1684. SYN. *A. cruentus.* See Fig. 73.

A. h. atropurpureus (dark purple).* An improved variety of above.

A. melancholicus ruber (melancholy-red).* *h.* about 1ft. Japan. A compact growing variety, with large shaded crimson leaves. Largely used for bedding purposes.

A. salicifolius (willow-leaved).* *l.* 7in. to 15in. long, willow-shaped, linear, and wavy, which, by their drooping outline, present a very elegant and effective appearance. When fully grown, the leaves are brilliantly banded and tipped with orange, carmine, and bronze. *h.* 3ft. Philippine Isles, 1871.

A. s. Princess of Wales.* *l.* carmine, orange green, and bright yellow, beautifully blended. *h.* 3ft. A garden hybrid.

A. sanguineus (bloody). *fl.* purple, disposed partly in small heads in the axils of the upper leaves, and partly in slender, flexible spikes, which form a more or less branching panicle. July *l.* blood red. *h.* 3ft. Bahama, 1775.

FIG. 74. AMARANTUS TRICOLOR.

A. speciosus (showy).* *fl.* dark crimson purple, disposed in large erect spikes, forming a fine plumy panicle. July. *l.* suffused with a reddish tinge, which disappears at the time of flowering. *h.* 3ft. to 5ft. Nepaul, 1819.

Amarantus—*continued.*

A. s. aureus (golden). *fl.* of a fine brownish-golden hue. Very effective when grown in masses.

A. tricolor (three-coloured).* *l.* of a fine, transparent, purplish-red or dark carmine from the base to the middle; a large spot of bright yellow occupies the greater part of the upper end of the leaf; point generally green; leafstalks yellow. *h.* 1½ft. East Indies, 1548. See Fig. 74. There are several garden varieties of this species, requiring a somewhat warmer situation.

AMARYLLIDEÆ. A large and important order of usually bulbous plants, sometimes with a stem. Flowers solitary, umbellate, or paniculate; perianth superior, six-lobed, often with a corona at the top of the tube. Leaves ensiform or linear. This order contains many very beautiful genera, including *Agave*, *Amaryllis*, *Crinum*, *Hæmanthus*, *Hippeastrum*, *Narcissus*, *Pancratium*, and several others.

AMARYLLIS (from *Amaryllis*, the name of a countrywoman mentioned by Theocritus and Virgil). ORD. *Amaryllideæ*. Half-hardy or hardy, deciduous, bulbous plants. Flowers large, sweet-scented, pedicelled; spathe two-leaved; umbels few-flowered; perianth with a very short tube, funnel-shaped, six-parted, sub-regular or irregular; segments many-nerved, broad, undulate, spreading somewhat at the apices; stamens at the summit of the tube, unequal, declined; anthers fixed by the middle, incumbent, curved into a circular arch after bursting; style declined; stigma thickened, sub-three-lobed; scape tall, solid, compressed. Capsule obovate; seeds globose, fleshy. Leaves appearing at a different season from the scapes, numerous, strap-shaped. The following genera are sometimes arranged hereunder, but in this work are treated separately: *Brunsvigia*, *Crinum*, *Hippeastrum*, *Nerine*, *Sprekelia*, *Sternbergia*, *Vallota*, *Zephyranthes*. Warm, dry, and well-drained positions in front of hot-houses, or at the base of south or south-west walls, are the most suitable sites for *A. Belladonna* and its varieties. The soil should be composed of good, fibrous loam, leaf mould, and sand, in equal parts. Insert the bulbs 6in. to 8in. deep, and surround with sand, after which they may be covered with the compost, which should be pressed firmly about them; they should not be again disturbed for years, when they will ultimately establish themselves, and produce grand masses of blossom. The best time to plant a fresh stock is June or July, when they commence root-action, before the flower-stems are sent up. In their growing season, and in dry weather, an occasional soaking of clear water, or liquid manure, will be greatly beneficial. The extremely ornamental plants now largely grown, and frequently classed as *Amaryllis* in nurserymen's catalogues, belong to the genus *Hippeastrum*. For pot-culture of the Belladonna Lily, *see* **Hippeastrum.**

FIG. 75. AMARYLLIS BELLADONNA, showing Habit at Flowering Season.

A. Belladonna.* Belladonna Lily. This splendid species is very variable, both in the size and colour of the flowers, frequently producing variously-shaded flowers, from almost white to a reddish or purplish hue. Autumn. West Indies, 1712. See Fig. 75. The leaves and flowers are not produced together. In Fig. 76 they are both shown in the same illustration for economy of space.

A. B. pallida (pale).* A pale-coloured variety. *h.* 2ft.

AMASONIA (named in honour of Thomas Amason, one of the earlier American travellers). SYN. *Taligalea*. ORD. *Verbenaceæ*. A genus comprising six species (which may be reduced to four) of stove sub-shrubs, natives of tropical America. Flowers yellow or sulphur-coloured, racemose or panicled; calyx five-cleft; corolla five-cleft, sub-bilabiate. Leaves alternate, toothed or rarely entire. For culture of the only species introduced, *see* **Clerodendron.**

Amasonia—*continued.*

A. punicea (reddish-brown). *fl.* yellow, with pretty, brownish bracts; peduncles once or twice trifid, cymose or one-flowered. May and June. *l.* slender, 3in. to 2in. long, oblong- or elliptic-lanceolate, shortly acuminate, unequally toothed. Stem erect, simple or slightly branched. *h.* 2ft. to 3ft. Brazil, 1884.

AMATEUR. This term is usually meant to refer to one who has a taste for a particular pursuit, and who is, in a pecuniary point of view, independent of it. An Amateur gardener is one who rears and grows his plants, and cultivates his garden, for his own amusement—for mere love of horticulture.

FIG. 76. AMARYLLIS BELLADONNA, showing Bulb and Flower Scape.

AMBER, SWEET. *See* **Hypericum Androsæmum.**

AMBER-TREE. *See* **Anthospermum.**

AMBROSINIA (commemorative of Professor Giacinti Ambrosini, of Bologna). ORD. *Aroideæ* (*Araceæ*). A curious, half-hardy, tuberous perennial, thriving in any light soil, with protection in winter. Increased by seeds, and by divisions. The former should be sown, as soon as ripe, in a cool house; and the latter should be made just previous to new growth in spring.

Ambrosinia—*continued.*

A. Bassii (Bass's).* *fl.*, spathes prolonged into a long tail, and a tongue-shaped spadix, with the male flowers on one side, and so placed as to preclude the access of pollen to the stigma on the other side of the spathe, save by insect agency. *l.* oblong, stalked. *h.* 4in. Corsica, Sardinia, 1879.

AMBURY, or **ANBURY.** The name given to galls of small Weevils (*Ceuthorhynchus sulcicollis*) which appear on the roots of Cabbages and Turnips, as well as of the Wild Mustard, and of other weeds belonging to the genus *Brassica*. The galls form swellings individually about the size of split peas, but often two or more are joined to form considerable masses. In each is a space inclosing a white grub. Anbury is usually not very hurtful. It is quite distinct from Clubbing. The galled roots should be collected, before the grubs emerge, and burned.

AMELANCHIER (Savoy name of the Medlar, to which this genus is closely allied). TRIBE *Pomaceæ* of ORD. *Rosaceæ*. Hardy, deciduous shrubs or small trees, with racemes of white flowers, and simple, serrated leaves; bracteas linear-lanceolate. Pome, when mature, three to five-celled. They are of easy cultivation, in a somewhat rich, loamy soil, and are propagated by layers or cuttings, in autumn, in sheltered situations; by seeds, and by grafting, in early spring, on the Hawthorn or the Quince, or the weaker on the stronger-growing species.

A. canadensis (Canadian).* Grape Pear. *fl.* white. April. Pome purple. *l.* oblong-elliptic, cuspidate, when young rather villous, but at length glabrous. *h.* 6ft. to 8ft. Canada, 1746. A very ornamental tree, having a profusion of flowers in early spring, and rich autumnal foliage. SYN. *Pyrus Botryapium.*

A. c. florida (flowery).* *fl.* white, numerous, in upright racemes. May. Pome purple. *l.* oblong, obtuse at both ends, coarsely serrate in the terminal portion, glabrous in every state. *h.* 10ft. to 20ft. North America, 1826.

A. c. ovalis (oval-leaved). *fl.* white; racemes pressed together. April. *l.* roundish-elliptic, acute when rather young, velvety beneath, glabrous when mature. *h.* 6ft. to 8ft. North America, 1800.

A. c. parvifolia (small-leaved). This has a dwarfer habit, and shorter leaves, than the type.

A. sanguinea (bloody). *fl.* white; racemes capitate. April. Pome blackish-purple. *l.* oblong, rounded at both ends, sharply serrated, always naked. *h.* 4ft. to 8ft. North America, 1800. This form differs principally from *A. canadensis* in the fewer flowers, much shorter raceme, and shorter, broader, and more ovate petals.

A. vulgaris (common).* *fl.* white. April. Pome darkish-purple. *l.* roundish-oval, bluntish, pubescent beneath, at length glabrous. *h.* 3ft. to 9ft. Europe, 1596. A desirable shrub, producing an abundance of flowers. SYN. *Mespilus Amelanchier.*

AMELLUS (a name employed by Virgil for a blue, Aster-looking plant growing on the banks of the river Mella). ORD. *Compositæ*. Pretty, branched, ascending or diffuse, perennial herbs. Flowers in solitary heads. Leaves hairy, lower ones opposite, upper alternate. Of very easy culture, in ordinary garden soil. Increased by divisions, or cuttings, inserted under glass, in spring.

A. Lychnitis (Lychnitis). *fl.-heads* violet, solitary, terminal, and lateral. June. *l.* linear, lanceolate, entire, hoary. *h.* 6in. Cape of Good Hope. Evergreen, greenhouse trailer.

AMENTUM. A catkin. A deciduous spike of unisexual, apetalous flowers.

AMERICAN ALMOND. *See* **Brabejum.**

AMERICAN ALOE. *See* **Agave americana.**

AMERICAN BLIGHT, or **WOOLLY APHIS** (*Schizoneura lanuginosa*). The white, cottony-looking matter which is found upon the bark of the Apple and other trees of a similar nature, belongs to a species of Aphis, which has short legs: the females are wingless, while the males are winged; the latter appear in July and August. The insects belong to a group of Aphides unprovided with honey tubes on the hinder part of the body, and in which the third vein of the front wing shows only one fork. The woolly coating also distinguishes them from true Aphides. The Blight is said to have been imported from America in 1787, but this is uncertain.

As these insects get into the cracks and under the bark

American Blight, or **Woolly Aphis**—*continued.*

of trees, they are hard to dislodge. The injury inflicted is not apparent for some time; but, in process of time, large, cankerous wounds are produced, which gradually (with the aid of the insects) destroy the branches, and render the tree useless. If young trees are attacked, they are rendered valueless in a very short time. The insects hide in crevices of the bark of the trees each autumn, and remain dormant during the winter, ascending to their old quarters as the weather becomes warm. Trees which are covered with moss and lichens probably serve as places for hybernation; hence, it is desirable to remove such hiding-places, as well as all pieces of dead bark. To their being left may be frequently attributed the severe attacks of Blight experienced where they exist on trees. So soon as the cottony substance makes its appearance, one of the following remedies should be applied, and, if persisted in for a few seasons, the trees will be quite cleared.

Brushing and Scraping. In winter, the trees should be thoroughly cleaned; and, so long as there is a chance of the insects being in the bark, all loose pieces, moss, &c., should be brushed off, and the parts affected should be thoroughly saturated with a strong solution of soft soap or of soft soap and lime-water, applied with a stiff brush, so as to enter all the crevices.

Gas Liquor. This is the ammoniacal liquor from gas works. It must be diluted with from eight to twelve times its bulk of water, or it is dangerous to the trees; in fact, after dilution, it is advisable to test it, previous to using to any great extent. As the woolly covering of the insects resists water, it is desirable that the liquor be applied with a brush, and forced amongst the Blight.

Infusion of Tobacco Leaves (½lb. to 1 gallon) kills the insects on shoots dipped into it.

Paraffin or Petroleum. This is a simple and useful remedy. Obtain a painter's half-worn sash-tool, free from paint, and just moisten it in the oil. Then brush out each infested place as often as the Blight appears, and in one season the trees will be cleared.

Spent Tan. Collect spent tan into a heap a month or two before it is to be used, and if it has heated well and rotted, so much the better. In winter, clear away all leaves, rubbish, grass, &c., and spread the tan at the rate of about thirty loads to the acre, taking care that it surrounds the base of each tree infested with Blight. Practical proof of its utility has been given.

Turpentine and other Spirits. The mode of applying these is the same as for paraffin, but they frequently injure the bark, and sometimes kill young trees.

To kill insects on the roots, it is well to clear away the soil as far as possible from them, and to saturate the place with soapsuds or ammoniacal solutions; soot, quicklime, or other applications to the soil would also prove useful.

Other remedies that have been suggested are the drainings of stables, and grafting-clay plastered over the bark.

AMERICAN CENTAURY. *See* **Sabbatia.**

AMERICAN CHINA ROOT. *See* **Smilax.**

AMERICAN COWSLIP. *See* **Dodecatheon.**

AMERICAN CRANBERRY. *See* **Oxycoccus macrocarpus.**

AMERICAN CRESS. *See* **Barbarea.**

AMERICAN DEWBERRY. *See* **Rubus canadensis.**

AMERICAN GOOSEBERRY. *See* **Pereskia aculeata.**

AMERICAN GREAT LAUREL. *See* **Rhododendron maximum.**

AMERICAN HIGH BLACKBERRY. A common name for **Rubus villosus** (which *see*).

AMERICAN MANDRAKE. *See* **Podophyllum peltatum.**

AMERICAN MOUNTAIN ASH. *See* **Pyrus americana.**

AMERICAN PLANTS. This term includes *Rhododendron*, *Azalea*, and several others of similar habit and constitution; indeed, any hardy, flowering shrubs requiring a moist peat border.

AMERICAN SPANISH OAK. *See* **Quercus falcata.**

AMERICAN SWAMP LILY. *See* **Saururus cernuus.**

AMERICAN WHITE OAK. *See* **Quercus alba.**

AMERICAN WILD BLACK CURRANT. *See* **Ribes floridum.**

AMERICAN WILD RED RASPBERRY. *See* **Rubus strigosus.**

AMERIMNON (from *a*, privative, and *merinna*, care; in allusion to the little attention the plant requires; name originally applied to the House-leek). SYN. *Amerimnum.* ORD. *Leguminosæ.* Ornamental, evergreen, stove shrubs, with alternate, stalked, ovate, somewhat cordate, simple leaves. For culture, *see* **Anona.**

A. Brownei (Browne's).* *fl.* white, sweet-scented; peduncles axillary, ten-flowered, glabrous or puberulous. May. *l.* ovate, somewhat cordate, acute, glabrous. *h.* 6ft. to 10ft. Jamaica, 1793. Requires a trellis or other support.

A. strigulosum (strigulose). *fl.* white; racemes axillary, solitary, three times longer than the petioles. May. *l.* ovate, rather cordate, obtuse, clothed with adpressed hairs on both surfaces; branches and petioles clothed with light brown, dense, short hairs. *h.* 6ft. to 10ft. Trinidad, 1817.

AMERIMNUM. A synonym of **Amerimnon** (which *see*).

AMHERSTIA (commemorative of Countess Amherst, a zealous promoter of natural history, particularly botany). ORD. *Leguminosæ.* A stove, evergreen tree of almost unsurpassed magnificence and brilliancy, requiring a very high and moist temperature. It delights in a rich, strong loam, and may be propagated by cuttings of the half-ripened wood, inserted in sand, under a glass in bottom heat of about 80deg.; also by seeds.

A. nobilis (noble).* *fl.* of a fine vermilion colour, diversified with yellow spots, large; racemes long, pendulous, axillary. May. *l.* large, impari-pinnate, bearing six to eight pairs of leaflets. *h.* 30ft. to 40ft. India, 1837. The flowers are, unfortunately, somewhat ephemeral, lasting but a few days in perfection, during which period, however, no object in the whole range of the vegetable kingdom presents a more striking aspect than this tree.

AMICIA (commemorative of J. B. Amici, a celebrated French physician). ORD. *Leguminosæ.* A pretty, greenhouse or half-hardy perennial, succeeding in any warm, sheltered spot. Young cuttings will root in sand, under a hand glass, in heat.

A. Zygomeris (two-jointed-podded).* *fl.* yellow, splashed with purple on the keel; peduncles axillary, five or six-flowered. Autumn. Legumes with two joints. *l.* abruptly pinnate, with two pairs of cuneate-obcordate, mucronate leaflets, which are full of pellucid dots; branches and petioles pubescent. *h.* 8ft. Mexico, 1826.

AMMOBIUM (from *ammos*, sand, and *bio*, to live; in reference to the sandy soil in which it is found). ORD. *Compositæ.* This well-known everlasting is closely allied to *Gnaphalium*, from which it differs principally in habit. Receptacle with oblong, pointed, toothed, chaffy scales; involucre of imbricated leaflets. It may be treated as a half-hardy annual, or as a biennial, if seeds are sown in September and kept in a cool greenhouse during the winter, and this is the best way to grow it. Any moderately good soil suits it.

A. alatum (winged). *fl.-heads* about 1in. across, of a silvery whiteness, with the exception of the yellow disk florets, very numerous, in loose, corymbose panicles. May to September. *l.* oblong-lanceolate; radical ones in a tufted rosette. Stems winged—hence the specific name. *h.* 1½ft. to 2ft. New Holland, 1822. See Fig. 77.

A. a. grandiflorum (large-flowered).* *fl.-heads* purer white, nearly twice the size of those in the type. This variety, which comes true from seed, is a great acquisition.

AMMOCHARIS. *See* **Brunsvigia.**

AMMODENDRON (from *ammos*, sand, and *dendron*, a tree; in reference to its natural habitat). ORD. *Leguminosæ.* A small, neat, hardy evergreen, silky shrub, having the petioles hardening into spines; an excellent subject for shrubberies. It thrives in an ordinary soil, with good drainage, and is propagated by layers and seeds.

A. Sieversii (Sievers').* *fl.* purple, disposed in racemes. June. *l.* bifoliolate; leaflets lanceolate, silky-white on both surfaces. *h.* 2ft. to 4ft. Siberia, 1837.

AMMYRSINE. *See* **Leiophyllum.**

AMOMOPHYLLUM. *See* **Spathiphyllum.**

FIG. 77. INFLORESCENCE OF AMMOBIUM ALATUM.

AMOMUM (from *a*, not, and *momos*, impurity; in reference to the quality of counteracting poison). ORD. *Scitamineæ.* Stove, deciduous, herbaceous perennials, chiefly aromatic, formerly used in embalming. Flowers produced close to the ground, in spikes or clusters, bracteate. Leaves distichous, sheathing at the base, lanceolate, entire. For culture, *see* **Alpinia.**

A. angustifolium (narrow-leaved).* *fl.* sometimes of a uniform chrome-yellow, sometimes crimson, with the labellum of a yellow colour, more or less pale, and sometimes entirely crimson; scape naked, from 3in. to 8in. in length; spike capitate. July. *l.* linear-lanceolate. *h.* 8ft. Madagascar.

A. Cardamomum (Cardamom).* *fl.* brownish; lip three-lobed, spurred; scape compound, flexuous, procumbent. August. *h.* 8ft. East Indies, 1823.

A. Danielli (Daniel's). *fl.* 4in. across; outer sepals fine red; the spreading labellum whitish, tinged with rose and yellow; scape short, arising from the bottom of the stem. *l.* oblong-lanceolate, 9in. long. *h.* 2½ft. Western Africa.

A. grandiflorum (large-flowered). *fl.* white, numerous, close; spike short. June. *l.* elliptic-lanceolate, pointed. *h.* 3ft. Sierra Leone, 1795.

Amomum—*continued.*

A. Granum Paradisi.* Grains of Paradise. *fl.* white, tinged with yellow and rose. *l.* elliptic-lanceolate, long-pointed. Stems very red at base, and dull purplish-red above from the long, sheathing leafstalks. *h.* 3ft. West Africa.

A. Melegueta (Melegueta).* Grains of Paradise. *fl.* pale pink, solitary, with an orbicular, irregularly toothed lip. May. *l.* narrow, linear-elliptic, distichous, sessile. *h.* 1ft. to 2ft. Sierra Leone, 1869. Habit creeping.

A. sceptrum (sceptre). *fl.* bright rose purple, large, sub-erect; the most conspicuous portion is the lip, which is 2½in. in diameter; flower-scapes 6in. high. January. *l.* narrow, oblong-lanceolate. *h.* 5ft. to 6ft. Old Calabar, 1863.

A. vitellinum (yolk-of-egg-coloured). *fl.* yellow; lip oblong, obtuse, toothed; spike oblong, sessile, rather loose. April *l.* oval. *h.* 2ft. East Indies, 1846. Plant stemless, glabrous.

AMORPHA (from *a*, not, and *morphe*, form; incomplete formation of the flowers). Bastard Indigo. ORD. *Leguminosæ*. A handsome genus of hardy deciduous shrubs with very graceful impari-pinnate leaves, and many pairs of leaflets, which are full of pellucid dots. Racemes spicate, elongated, usually in fascicles at the tops of the branches; corolla without wings and keel; vexillum or standard ovate, concave. They are well adapted for small shrubberies, requiring a sheltered situation, and thrive well in common garden soil. Increased by layers, or cuttings, taken off at a joint, and planted in a sheltered situation early in autumn; these should be allowed to remain undisturbed till the following autumn. Amorphas produce an abundance of suckers, from which they may be readily propagated.

A. canescens (hoary).* The Lead Plant. *fl.* dark blue. July. *l.*, leaflets ovate-elliptic, mucronate. *h.* 3ft. Missouri, 1812. Whole plant clothed with hoary hairs.

A. fruticosa (shrubby).* The False Indigo. *fl.* very dark bluish purple. June. *l.*, leaflets elliptic-oblong; lower ones distant from the stem. *h.* 6ft. Carolina, 1724. Shrub glabrous, or a little villous. There are several varieties, having mucronate, emarginate, or narrower leaflets, but all with purple flowers. A host of names, representing the merest forms of *A. fruticosa*, are to be found in nurserymen's catalogues. Amongst them are: *caroliniana, crocea, crocea-lanata, dealbata, fragrans, glabra, herbacea, nana, pubescens*, &c. These differ so slightly from the type and from each other, that it is impossible to distinguish them.

AMORPHOPHALLUS (from *amorphos*, deformed, and *phallos*, a mace; alluding to the inflorescence). SYN. *Pythion*. Including *Proteinophallus*. ORD. *Aroideæ* (*Araceæ*). A very remarkable genus, closely allied to *Arum*, but distinguished therefrom by "their spreading, not convolute, spathes; by their anthers opening by pores, not by longitudinal slits; by the numerous cells to the ovary; and by the solitary, erect ovules, those of *Arum* being horizontal." A soil consisting of two-thirds good rich loam, with the additional third of sweet manure, thoroughly rotted, suits them well. Other essentials are plenty of pot room, a genial atmosphere, and a temperature ranging from 55deg. to 65deg., or even 70deg. They require to be kept dry, and warm in winter, as nothing is more fatal to them than cold or damp. Beneath a shelf or stage in the stove is an excellent spot for them, or they may be stored in sand, and kept free from frost. They are difficult to increase; the corms of most of them are of great size, and rarely make offsets. Efforts should consequently be made to induce the plants to seed whenever practicable. All the species are strikingly effective in sub-tropical bedding. For fertilising and growth of seedlings, *see* **Arum.**

A. campanulatus (bell-shaped).* Similar to *A. Rivieri*, but the flowers are brown, red, and black, and the scape is neither so stout nor so tall. *h.* 2ft. India, 1817. SYN. *Arum campanulatum.*

A. grandis (large). *fl.*, spathe green, white inside; spadix purplish. *h.* 3ft. Java, 1865. Stove species.

A. Lacourii (Lacour's).* *l.* pedatisect, the ultimate segments lanceolate, yellow-spotted; petioles transversely mottled with yellow markings. Cochin China, 1879. Greenhouse. The correct name of this species is *Pseudodracontium Lacourii.*

A. nivosus. *See* **Dracontium asperum.**

A. Rivieri (Rivier's).* *fl.*, spadix, spathe, and scape, reaching 3ft. or more in height, appearing before the leaves; scape stout and strong, of a deep green colour, speckled or dotted with rose; spadix projecting, deep red; spathe of a rosy-green colour. March to May. *l.* solitary, decompound, 40in. to 50in. across, on tall marbled petioles. Cochin China. This is, perhaps, the most useful species of the genus. SYN. *Proteinophallus Rivieri.* See Fig. 78.

Amorphophallus—*continued.*

FIG. 78. AMORPHOPHALLUS RIVIERI, Foliage and Inflorescence.

A. Titanum (Titan's).* *fl.*, spadix 5ft. high, black purple; spathe nearly 3ft. in diameter, campanulate in shape, with patent and deeply toothed edges. The deeper portion of the interior is pale greenish, but the limb is of a bright black purple hue; the outside is pale green, smooth in the lower portion, but thickly corrugated and crisp above; scape about 1½ft. long, green, marked with small whitish orbicular spots. *l.* the divided blade covers an area of 45ft. in circumference. West Sumatra, 1878. As will be seen from the above, this extraordinary plant is of gigantic proportions, and, in size of the flowers, eclipsing nearly all others in the vegetable kingdom. SYN. *Conophallus Titanum.*

AMORPHOUS. Without definite form.

AMPELOPSIS (from *ampelos*, a vine, and *opsis*, resemblance; resembling the Grape Vine in habit, and to which it is closely allied). SYN. *Quinaria*. ORD. *Ampelideæ*. A genus nearly allied to *Vitis*. Calyx slightly five toothed; petals concave, thick, expanding before they fall; disk none. Fast growing and ornamental climbing, hardy deciduous shrubs, of very easy culture in common garden soil. Cuttings, having a good eye, may be taken in September, and pricked either under handlights in sandy soil on the open border, or in pots stood on the stage or shelf in a greenhouse; they root readily, and will be fit for transplanting early in the spring. Or cuttings made from the young soft wood, expressly grown for the purpose, in spring, root freely in gentle heat. This applies especially to *A. tricuspidata*. They are also easily increased by layers. Most of the species will thrive with equal vigour in almost any position, however exposed.

A. aconitifolia (Aconite-leaved).* *l.* palmisect, with pinnatifid segments. China, 1868. A slender and very elegant free-growing species, with long reddish branches. There are two or more varieties. SYNS. *A. lucida, A. triloba, A. tripartita*, and *Vitis dissecta.* See Fig. 79.

A. bipinnata (bipinnate). *fl.* green, small; raceme stalked, twice bifid. Berries globose. June. *l.* bipinnate, smooth; leaflets deeply lobed. *h.* 10ft. Virginia, 1700.

A. hederacea (Ivy-leaved). Synonymous with *A. quinquefolia.*

A. japonica (Japanese). Synonymous with *A. tricuspidata.*

A. lucida (shining). Synonymous with *A. aconitifolia.*

A. napiformis (turnip-like).* Greenish. China, 1870. See Fig. 80.

A. quinquefolia (five-leaved).* Virginian Creeper. *fl.* greenish-purple; raceme corymbose. June. *l.* palmate, with three and five leaflets, smooth on both surfaces; leaflets stalked, oblong-acuminated, mucronately toothed; autumnal tint red. North America, 1629. SYN. *A. hederacea.*

Ampelopsis—*continued.*

A. q. hirsuta (hairy). *l.* downy on both surfaces.

A. serjaniæfolia (Serjania-leaved).* *l.* green, palmately five-parted, or the upper ones three-parted, the intermediate division being often ternate or pinnate; leaflets obovate acute, and incisely toothed or sublobate; the rachis is articulately winged. Japan, 1867. SYNS. *A. tuberosa, Cissus viticifolia.* Roots tuberous; see Fig. 81.

FIG. 79 STEM AND LEAVES OF AMPELOPSIS ACONITIFOLIA.

A. tricuspidata (three-pointed).* *l.* very variable in shape; younger ones almost entire; older ones larger, roundish-cordate, divided to the middle into three deltoid lobes, which run into little tails, and are coarsely toothed at the margin. Japan, 1863. SYNS. *A. Veitchii, Vitis japonica* (of gardens).

A. triloba (three-lobed). A synonym of *A. aconitifolia.*

A. tripartita (three-parted). A synonym of *A. aconitifolia.*

A. tuberosa (tuberous). A synonym of *A. serjaniæfolia.*

A. Veitchii (Veitch's). A synonym of *A. tricuspidata.*

AMPELOSICYOS. A synonym of **Telfairia.**

AMPHIBLEMMA CYMOSUM. *See* **Melastoma corymbosum.**

AMPHIBLESTRA. Included under **Pteris.**

AMPHICARPÆA (from *amphi*, both, and *karpos*, a fruit; in allusion to the two kinds of pods—those of the upper flowers being scimitar-shaped, three or four-seeded; those of the lower, pear-shaped, fleshy, usually ripening but one seed; these lower pods bury themselves in the ground after fertilisation). ORD. *Leguminosæ.* A genus of ornamental annuals, with herbaceous, twining stems, and sometimes apetalous flowers, allied to *Wistaria.* The species are of easy culture. Seeds should be sown in the open border, in spring, in a sunny situation.

Amphicarpæa—*continued.*

A. monoica (monœcious). Hog Pea-nut. *fl.* with a pale violet vexillum, and white keel and wings; racemes axillary, pendulous. June to August. *l.* pinnately-trifoliate; leaflets ovate, glabrous. North America, 1781.

FIG. 80. TUBERS AND LEAF OF AMPELOPSIS NAPIFORMIS.

FIG. 81. ROOTS OF AMPELOPSIS SERJANÆFOLIA.

AMPHICOME (from *amphi*, on both sides, and *kome*, a head of hair; in reference to the seeds being furnished with a tuft of hairs at both ends). ORD. *Bignoniaceæ.* Flowers axillary or terminal. Leaves alternate, unequally pinnate. Very ornamental greenhouse or half-hardy rock herbaceous plants. If planted outside, they must be protected during the winter from wet and severe frosts. A mixture of loam, sand, and leaf soil suits them well. Increased by striking the young shoots in spring in sandy

Amphicome—*continued.*

soil in gentle heat; or by seed, which should be sown in early spring, in pots of sandy soil placed in a greenhouse.

A. arguta (finely-cut).* *fl.* red, drooping; racemes axillary, terminal; corolla tubular near the base, ventricose above. August. *l.* alternate, impari-pinnate; leaflets opposite, on short petioles, three to four pairs, lanceolate, acuminated, deeply serrated. *h.* 3ft. Himalaya, 1837.

A. Emodi (Emodian).* *fl.* rose and orange, erect; racemes axillary; corolla 1½in. to 2in. long, bell-shaped, slightly tubular below. August to October. *l.* impari-pinnate, with numerous leaflets. *h.* 1ft. to 1½ft. India, at high altitudes, 1852. A very beautiful plant.

AMPHILOPHIUM (from *amphilophos*, crested on all sides; limb of corolla much curled). SYN. *Amphilobium.* ORD. *Bignoniaceæ.* A handsome stove evergreen climber. Corolla somewhat coriaceous, with a short tube, and a large ventricose throat. Loam and peat, well mixed, suit it best; cuttings from young shoots root readily in sand, under a hand glass, with bottom heat, during the spring months.

A. paniculatum (panicled).* *fl.* rose; panicle terminal, composed of three-flowered peduncles. June. *l.* joined by pairs, opposite; leaflets ovate-roundish, acuminated, subcordate. WestIndies, 1738.

AMPHION. A synonym of **Semele** (which *see*).

AMPLEXICAULIS. Embracing the stem; usually applied to leaves.

AMPULLACEOUS. Resembling a bladder or flask.

AMSONIA (in honour of Charles Amson, a scientific traveller in America). ORD. *Apocynaceæ.* Very pretty hardy, herbaceous perennials, with alternate leaves, and terminal panicles of pale blue flowers; corolla with linear lobes, and a narrow funnel-shaped tube. They thrive in half shady positions in borders, or the edges of shrubberies, where they will not need to be frequently transplanted. Propagated by cuttings during the summer months, or by divisions of the roots in spring.

A. latifolia (broad-leaved). Synonymous with *A. Tabernæmontana.*

FIG. 82. AMSONIA SALICIFOLIA, showing Habit and Flower.

A. salicifolia (willow-leaved).* *fl.* light blue, in terminal corymbose cymes; corolla small, funnel-shaped, with a rounded tube; throat whitish, bearded. Summer. *l.* lanceolate, smooth, acute. *h.* 1½ft. to 2½ft. North America, 1812. Habit less erect than the following species. See Fig. 82.

A. Tabernæmontana (Tabernæmontana-like).* *fl.* pale blue, in cymes; petals lanceolate, acute, slightly hairy on the outside; sepals also lanceolate, acute. Summer. *l.* ovate-lanceolate, acute, shortly stalked. *h.* 1½ft. to 2½ft. North America, 1759. SYNS. *A. latifolia, Tabernæmontana Amsonia.*

AMYGDALUS (from *amysso*, to lacerate; fissured channels in the stone of the fruit). Almond. ORD. *Rosaceæ.* TRIBE *Drupaceæ.* Well known, ornamental, deciduous spring flowering shrubs. Drupe clothed with velvety pubescence, with a fibrous dry rind, separating irregularly, having the stone of the fruit pitted or smooth. The larger-growing species are very excellent for shrubberies, or as specimen trees; being in blossom before most other trees, they make a fine appearance in early spring. The dwarfer kinds are also well fitted for small

Amygdalus—*continued.*

shrubberies or the fronts of large ones. For greenhouse culture they should be obtained in a small pyramidal shape; they are not, however, suited to a small house, as the plants, to bloom well and be effective, ought to be at least 2ft. or 3ft. high, and proportionately wide. Plenty of root room is essential. After potting, water thoroughly, and place the trees in an orchard house for a few weeks, when they may be removed to their permanent station. A temperature of about 50deg. or 55deg. is sufficient to hasten the flowering; a higher temperature is apt to frustrate the object in view. After flowering, gradually harden off the plants until about the end of May, when they may be plunged out of doors for the season. Repotting should be done as soon as the leaves fall. Increased by budding upon seedling plum-stocks in summer. The Almond is grown on the Continent for its fruit. *See also* **Prunus.**

A. argentea (silvery). A synonym of *A. orientalis.*

A. Besseriana (Besser's). A synonym of *A. nana.*

A. cochinchinensis (Cochin China). *fl.* white; racemes small, sub-terminal. *fr.* ovate, ventricose, acute at the apex. March. *l.* oval, quite entire. *h.* 30ft. to 40ft. Cochin China, 1825. Greenhouse.

FIG. 83. FLOWERING BRANCH OF AMYGDALUS COMMUNIS.

A. communis (common).* Common Almond. *fl.* white or rose coloured, solitary. March. *fr.* compressed, egg-shaped, tomentose. *l.* oblong lanceolate, serrulated. *h.* 10ft. to 30ft. Barbary, 1548. See Fig. 83.

A. c. amara (bitter).* Bitter Almond. *fl.* larger, white, but rose coloured at the base. April. Seeds bitter.

A. c. dulcis (sweet). Sweet Almond. *fl.* red, earlier; fruit ovate, compressed, acuminated. Seeds sweet. *l.* of a greyish green colour.

A. c. flore-pleno (double-blossomed).* *fl.* flesh colour, full double, rosy in the bud. *l.* oval-elliptic, acuminate.

A. c. fragilis (brittle). *fl.* pale rose coloured, rising with the leaves; petals broader, deeply emarginate. *l.* shorter than those of the type.

A. c. macrocarpa (large-fruited).* *fl.* whitish rose colour, large, rising before the leaves, with broadly obcordate undulated petals. *fr.* larger than that of the type, umbilicate at the base, but acuminated at the apex. *l.* broader than the type, acuminated. There are also numerous other varieties.

A. incana (hoary).* *fl.* red, solitary. April. Drupe compressed, pubescent. *l.* obovate, serrated, clothed with white tomentum beneath. *h.* 2ft. A handsome dwarf shrub. Caucasus, 1815.

A. nana (dwarf).* *fl.* rose coloured, solitary March. *fr.* of the same form as that of *A. communis*, but much smaller. *l.* oblong-

Amygdalus—*continued.*

linear, attenuated at the base, serrated, quite glabrous. *h.* 2ft. to 3ft. Tartary, 1683. SYN. *A. Besseriana.*

A. orientalis (Oriental). *fl.* rose coloured. March. *fr.* mucronate. *l.* lanceolate, quite entire, almost permanent, clothed with silvery tomentum, as well as the branches. *h.* 2ft. to 4ft. Levant, 1756. SYN. *A. argentea.*

AMYLACEOUS. Starch-like.

AMYRIDACEÆ. *See* **Burseraceæ.**

AMYRIS (from *a*, intensive, and *myron*, balm; the whole of the trees in this genus smell strongly of balm or myrrh). ORD. *Burseraceæ.* Ornamental stove evergreen trees, abounding in a resinous fluid. Flowers white, disposed in panicles. Leaves unequally pinnate. They thrive well in a mixture of loam and peat; and cuttings root freely in sand, under a hand glass with bottom heat, during the spring months.

A. balsamifera (balsam-bearing). Synonymous with *A. toxifera.*

A. braziliensis (Brazilian).* *fl.* white; panicles axillary, shorter than the leaves. August. *l.* with one to three pairs of opposite leaflets; leaflets lanceolate, tapering to the base, rounded at the apex, mucronate, quite entire, veiny, shining above, discoloured beneath. *h.* 20ft. Brazil, 1823.

A. heptaphylla (seven-leaved). *fl.* whitish yellow; panicles branched, axillary, and terminal. *l.* with three to four pairs of alternate, simple leaflets, which are stalked, obliquely-lanceolate, acuminated, entire. *h.* 16ft. India, 1823.

A. Plumieri (Plumier's).* Gum Elemi Tree. *fl.* white; panicles branched, terminal. The fruit of this species is the shape and size of an olive, but red, having an odoriferous pulp within it. *l.* leaflets three to five, all stalked, somewhat serrated, ovate, acuminate, villous beneath. *h.* 20ft. West Indies, 1820.

A. toxifera (poison-bearing).* *fl.* white; racemes simple, about the length of the petioles. *fr.* the shape of a pear, and of a purple colour, hanging in bunches. *l.*, leaflets five to seven, stalked, ovate, somewhat cordate, acuminated. *h.* 50ft. West Indies, 1818. The wood, known as Rhodes Wood, bears a fine polish, and has a pleasant smell. SYN. *A. balsamifera.*

ANACAMPSEROS (from *anakampto*, to cause return, and *eros*, love). SYN. *Rulingia.* ORD. *Portulacaceæ.* Very dwarf greenhouse succulent herbs or subshrubs, natives of the Cape of Good Hope. Flowers large, expanding only in the heat of the sun; petals five, very fugacious; sepals five, opposite, oblong, rather concrete at the base; pedicels one-flowered, short or elongated, disposed in racemes. Leaves ovate, fleshy. They grow freely in sandy loam, mixed with some lime rubbish; but little water is needed. Cuttings root freely if laid to dry a few days before planting. Leaves taken off close to the plants, and also left to dry for a short time before being planted, will take root. Seed, when obtainable, should be sown in the spring.

A. arachnoides (cobwebbed).* *fl.* white; petals lanceolate; racemes simple. July. *l.* ovate, acuminated, difformed, green, shining, cobwebbed. *h.* 6in. to 9in. 1790.

A. filamentosa (thready). *fl.* reddish, or deep rose coloured; petals oblong. August. *l.* ovate-globose, gibbous on both sides, and cobwebbed, rather rugged above. *h.* 6in. to 1ft. 1795.

A. intermedia (intermediate). Very like *A. filamentosa*, but has broader and more numerous leaves.

A. rubens (reddish).* *fl.* red; racemes simple. July. *l.* ovate, difformed, shining, dark green, somewhat reflexed at the apex. *h.* 6in. to 9in. 1796.

A. rufescens (rusty-coloured). *fl.* reddish, similarly disposed to *A. varians.* July. *l.* crowded, expanded and recurved, ovate, acute, thick, green, usually dark purple beneath. *h.* 6in. 1818.

A. Telephiastrum (Telephium-like). Synonymous with *A. varians.*

A. varians (varying).* *fl.* reddish; racemes few-flowered, subpanicled. July. *l.* ovate, difformed, glabrous. *h.* 3in. 1813. SYN. *A. Telephiastrum.*

ANACAMPTIS. *See* **Orchis.**

ANACARDIACEÆ. A rather large order of trees or shrubs, with a resinous, milky juice. Flowers inconspicuous. Leaves generally dotless. Ovary containing a single ovule. This order contains, among other genera, *Anacardium*, *Mangifera*, and *Rhus.*

ANACARDIUM (origin doubtful; probably from *ana*, like, and *kardia*, the heart; in reference to the form of the nut), ORD. *Anacardiaceæ.* An ornamental stove

Anacardium—*continued.*

evergreen tree with entire, feather-nerved leaves and terminal panicles of flowers; nut reniform, umbilicated, seated laterally on a fleshy, wide, pear-shaped peduncle. It requires a light loamy soil. Ripened cuttings, with their leaves left on, root freely in sand under a hand glass, in heat.

A. occidentale (Western). Cashew Nut. *fl.* reddish, small, very sweet scented, succeeded by an edible pome-like fruit of a yellow or red colour. *l.* oval, cuneated, very blunt, somewhat emarginate, obovate-oblong, entire, smooth. *h.* 16ft. West Indies, 1699.

ANADENIA. *See* **Grevillea.**

ANAGALLIS (from *anagelas*, to laugh; removing despondency: meaning doubtful). Pimpernel. ORD. *Primulaceæ.* Annual or perennial trailers with angular stems, opposite or verticillate leaves, and solitary pedunculate flowers; corolla rotate or funnel-shaped, deeply five-cleft. All are very pretty and free flowering plants, of easy culture. The annuals are raised from seed sown in a sunny spot in spring; the perennials are increased by striking cuttings of the young shoots, or division, at any time, either under a hand glass or in a close frame. Keep in the shade until well established, and gradually harden off. Plant outside in light rich soil for summer flowering, and each year secure a stock in frames during the winter. They require, if left out of doors, a protection during the winter, except *A. tenella.*

A. fruticosa (shrubby).* *fl.* axillary, large, vermilion, with a dark throat. May to August. *l.* verticillate, four in each whorl. *h.* 2ft. Morocco, 1803. A biennial.

A. grandiflora (large-flowered).* *fl.* very variable, but intense blue and deep vermilion red are predominant. May to autumn. *h.* 4in. Habit very compact and neat, and very floriferous. There are several varieties. Annual.

A. indica (Indian). *fl.* deep blue, small. July. *h.* 1ft. Nepaul 1824. Annual; trailing.

FIG. 84. ANAGALLIS LINIFOLIA, showing Habit and Flower.

A. linifolia (flax-leaved).* *fl.* brilliant blue, large, about ½in. in diameter. July. *l.* opposite. *h.* 9in. to 12in. Portugal, 1796. Perennial. There are many varieties, the best of which are the following. SYN. *A. Monelli.* See Fig. 84.

A. l. Brewerii (Brewer's).* *fl.* red. June. *h.* 9in. Known also as *Phillipsii.*

A. l. Eugenie (Eugenie's).* *fl.* blue, margined with white.

A. l. lilacina (lilac-flowered). *fl.* lilac. May. *h.* 1ft.

A. l. Napoleon III. (Napoleon's).* *fl.* crimson maroon, distinct and pretty.

A. l. Parksii (Parks'). *fl.* red, large.

A. l. phœnicea (Phœnician).* *fl.* scarlet. May. Morocco, 1803.

A. l. sanguinea (bloody). *fl.* bright ruby colour.

A. l. Wilmoreana (Wilmore's).* *fl.* bright blue purple, with yellow eye. *h.* 6in.

A. Monelli (Monell's). A synonym of *A. linifolia.*

A. tenella (delicate).* *fl.* delicate pink, with deeper veins; corolla bell-shaped. Summer. *l.* roundish, very small, opposite. A beautiful little native bog trailer, and one of the prettiest in the whole genus. Requires a boggy and wet soil

Anagallis—*continued.*

A. Webbiana (Webb's). *fl.* blue; petals with their tops slightly denticulated. June to August. *l.* several, verticillate. *h.* 4in. Portugal, 1828.

ANAGYRIS (from *ana*, backwards, and *gyros*, a circle; the pods are curved backwards at their extremities). ORD. *Leguminosæ*. An ornamental greenhouse or half-hardy shrub, having the two stipules placed opposite the leaves. It thrives in a mixture of loam, sand, and peat in equal proportions. Young cuttings should be planted in July in a pot of sand, and placed under a hand glass.

A. fœtida (fœtid). *fl.* yellow, hairy, like those of the Laburnum; racemes short. May. *l.* trifoliate; leaflets lanceolate, acute, entire. *h.* 6ft. to 8ft. South Europe, 1750. This shrub is fœtid in every part when bruised.

ANALOGY. Resembling a thing in form but not in function; or *vice versâ*. Corresponding with a thing in many points, but differing in more, or in points of more importance.

ANANAS (from *nanas*, the South American name for the Pine Apple). SYN. *Ananassa*. Pine Apple. ORD. *Bromeliaceæ*. Stove herbaceous perennials, having the berries collected with the bracts into a compound fruit. Leaves rigid; edges spiny. The variegated form is a useful plant for decorative purposes, and may be employed without the usual harmful consequences attending stove plants generally, but it must not be subjected to cold draughts. The soil should consist of two parts fibrous loam, one of peat, one of dung and leaf mould, and another of sand. Those propagated from suckers, which should be laid by a day or two and then inserted in a strong heat, have, as a rule, longer and lighter-coloured leaves. Offsets are often produced at the base of the fruit, and make stout plants, with high-coloured foliage. When the plants are potted in spring, plunge them in bottom heat, to hasten their growth; but this is not absolutely necessary. Should it be desired to fruit the variegated form, the plants may be submitted to the same process of culture as detailed under **Pine Apple** (which *see*).

A. bracamorensis (Bracamora). Brazil, 1879.

A. bracteata (bracted). *fl.* crimson. April. *h.* 3ft. Brazil, 1820.

A. lucida (shining). *fl.* pink. April. *h.* 3ft. South America, 1820.

A. macrodonta (large-toothed).* *fl.* reddish, tinted buff; spike elongate-ovoid, with imbricating dentate bracts. *fr.* conical, about 8in. long and 4in. wide, with conspicuous bracts, and highly perfumed. *l.* with conspicuous teeth. 1878. SYN. *Bromelia undulata*.

A. Mordilona (Mordilona; native name). *fr.* large, with a fine aroma. *l.* distinguished in being without spines. Columbia, 1869.

A. Porteana (Porter's).* *l.* armed on the margins with sharp spines, deep olive green, with a broad band of pale yellow running down the centre from base to apex. This species has a somewhat erect habit of growth. Philippines, 1866.

A. sativa (cultivated). Pine Apple. For culture, *see* **Pine Apple.**

A. s. variegata (variegated).* *l.* rosulate, finely arched, 2ft. or 3ft. long, serrated on the edges; centre bright green, sometimes with a few lines of white, broadly margined with rich creamy-yellow, tinged with red towards the margins. A very elegant variegated plant for vases, &c.

ANANASSA. *See* **Ananas.**

ANANTHERIX (from *a*, without, and *antherix*, an awn; there are no horn-formed processes from the base of the leaflets of the corona, as in *Asclepias*, to which it is closely allied). ORD. *Asclepiadeæ*. A small genus of pretty, hardy herbs. *A. viridis* is of easy culture in an open situation, and light soil. Increased by division of the root; or by seeds, which ripen in abundance.

A. viridis (green). *fl.* purplish-green, large; corolla sub-campanulate, five-cleft; umbels proceeding from the stem, sub-panicled, few-flowered. August. *l.* opposite, sessile, obovate-oblong, pointed, smoothish. *h.* 1ft. North America, 1812.

ANAPELTIS. Included under *Polypodium*.

ANARRHINUM (from *a*, without, and *rhin*, a snout; the corolla being without a spur, or furnished with a very short one). ORD. *Scrophularineæ*. Elegant little

Anarrhinum—*continued.*

half-hardy biennials or perennials allied to *Antirrhinum*. Flowers small, drooping, in long spike-formed, twiggy, and interrupted racemes. Radical leaves usually in a rosette; stem and branch leaves palmate-parted, or toothed at the apex; superior ones quite entire. They are of easy culture in ordinary garden soil; seed may be sown outside in spring, or they can be increased by growing cuttings, but they require protection during severe weather.

A. bellidifolium (Daisy-leaved).* *fl.* white, or pale blue; racemes slender, elongated. June. *l.* radical ones spathulate or obovate-lanceolate, deeply toothed; branch leaves deeply three to seven-parted. *h.* 2ft. South Europe, 1629.

A. Duriminium (Douro). A synonym of *A. hirsutum*.

A. fruticosum (shrubby). *fl.* white, without a spur. July. *l.* lower ones mostly tridentate at the apex; superior ones oblong, quite entire. *h.* 2ft. to 3ft. South Europe, 1826. Shrubby.

A. hirsutum (hairy). *fl.* whitish, a little larger than those of *A. bellidifolium*, of which it is, perhaps, only a downy variety. *h.* 1ft. to 2ft. Portugal, 1818. SYN. *A. Duriminium*.

ANASTATICA (from *anastasis*, resurrection; plant recovering its original form, however dry it may be, on immersion in water). ORD. *Cruciferæ*. A very curious and interesting little annual, the leaves of which fall off from the plant after flowering, the branches and branchlets then become dry, hard, and ligneous, and rise upwards and bend inwards at their points. This plant has the remarkable property of resuming vitality on being placed in water, after being kept in a dry state for many years. Seeds should be sown in heat, in the spring, and the plants afterwards potted off and plunged again in heat to hasten their growth,

FIG. 85. DRY FRUITING PLANT OF ANASTATICA HIEROCHUNTINA.

Anastatica—*continued.*

which cannot otherwise be fully developed with our precarious and sunless summers.

FIG. 86. ANASTATICA HIEROCHUNTINA.

A. Hierochuntina. Rose of Jericho. *fl.* small, white, sessile, disposed in spikes along the branches; petals obovate. July. *fr.*, or silicle, ventricose, with the valves bearing each an appendage on the outer side at the end. *l.* obovate, with stellate hairs; lower ones entire, upper ones slightly toothed Branches crowded lattice-wise into a globular form. *h.* 6in. Syria, &c., 1597. Supposed by some commentators to be the "*rolling thing* before the whirlwind" mentioned by Isaiah. See Figs. 85 and 86.

ANASTOMOSE. Branching of one vein into another.

ANBURY. *See* **Ambury.**

ANCEPS. Two-edged; as, for instance, the stem of an Iris.

ANCHIETEA (named after P. Anchietea, a Brazilian writer on plants). ORD. *Violarieæ*. An ornamental, stove, evergreen climber. Petals five, very unequal, two upper ones smallest, two intermediate ones longer, lowest one largest, with a spur at the base. The species thrives in a mixture of loam, sand, and peat. Young cuttings

Anchietea—*continued.*

root freely under a bell glass if planted in sand, and placed in a moderate heat.

A. pyrifolia (pear-leaved). *fl.* whitish, veined with red at the base, in axillary fascicles; lower petal obovate. July. *l.* alternate, stalked, stipulate, ovate, acute, crenated. Brazil, 1826.

ANCHISTEA. Included under **Woodwardia** (which *see*).

ANCHOMANES (name of doubtful origin). ORD. *Aroideæ*. A remarkable and beautiful stove tuberous-rooted perennial aroid, allied to *Amorphophallus*, and requiring somewhat similar treatment. As soon as the leaves die down, the plants should be repotted in rich sandy loam and leaf mould, with ample drainage. They will need scarce any water or attention until growth commences the following spring, when they must have an abundance of water, and a moist atmosphere. Summer temperature, 60deg. to 85deg.; winter, 55deg. to 60deg. Propagated by seeds and offsets.

A. Hookeri (Hooker's).* *fl.*, spathe pale purple, appearing before the leaf, much expanded; spadix whitish; scape prickly, shorter than the petiole. June. *l.*, petiole slender, prickly, bearing on its summit the horizontal blade, about 3ft. in diameter; this is divided into three primary divisions, which are again cut up into several leaflets, the largest of these being toothed. *h.* 3ft. Fernando Po, 1832. There is a variety with a paler-coloured spathe. SYN. *Caladium petiolatum.*

ANCHOVY PEAR. *See* **Grias cauliflora.**

FIG. 87. ANCHUSA CAPENSIS, showing Habit and detached Flowers.

ANCHUSA (from *anchousa*, paint for the skin; use of some species). ORD. *Borragineæ*. Very pretty hardy annuals, biennials, or perennials. Flowers in scorpoid racemes; corolla funnel-shaped; throat closed by erect, obtuse processes; nuts four, one-celled, inversely conical, with a contraction towards the point, fixed to the bottom of the calyx, perforated and concave at the base. Of easy culture, in ordinary soils, and preferring a sunny situation. Propagated by seeds, which should be sown in early spring in pots of sandy soil, when most of them will germinate in three or four weeks, some less. The honey-bee is very partial to this genus.

Anchusa—*continued.*

A. Agardhii (Agardh's). *fl.* purple, on short pedicels, distant, disposed in terminal racemes, which are generally conjugate. July. *l.* linear-lanceolate, tuberoled, strigose. *h.* 1ft. Siberia, 1820. Perennial. Rare.

A. azurea (blue). Synonymous with *A. italica.*

A. Barrelieri (Barrelier's). *fl.* blue, with a white tube and yellow throat; racemes conjugate, panicled, bracteate. May. *l.* oblong-lanceolate, denticulated, hispid. *h.* 1ft. to 2ft. South Europe, 1820. Perennial. SYNS. *Buglossum Barrelieri, Myosotis obtusum.*

A. capensis (Cape).* *fl.* blue; racemes terminal, panicled. July. *l.* linear lanceolate, hispid. Stem simple, hairy. *h.* 1½ft. Cape of Good Hope, 1800. Requires greenhouse protection in winter. Biennial. See Fig. 87.

FIG. 88. INFLORESCENCE OF ANCHUSA ITALICA.

A. italica (Italian). *fl.* bright blue or purple, in panicled racemes. Summer. *l.* lanceolate, entire, shining; radical ones sometimes 2ft. long. *h.* 3ft. to 4ft. Caucasus, &c., 1810. One of the best. SYNS. *A. azurea, A. paniculata.* See Fig. 88.

A. latifolia (broad-leaved). Synonymous with *Nonnea rosea.*

A. myosotidiflora (Myosotidium-flowered). *fl.* fine blue; throat yellow; raceme terminal, panicled, bractless. July. *l.* large, radical ones on long petioles, reniformly cordate; those of the stem sessile, ovate, hairy. *h.* 1ft. Siberia, 1825. A pretty plant. SYN. *Myosotis macrophylla.*

A. officinalis (officinal). *fl.* blue or purple, sessile, imbricate; spikes joined by pairs, terminal. June to October. *l.* lanceolate, hispid; radical ones tufted. *h.* 1ft. to 2ft. Britain, naturalised here and there.

A. o. incarnata is a variety with flesh coloured flowers.

A. paniculata (panicled). Synonymous with *A. italica.*

A. sempervirens (evergreen). *fl.* rich blue, in short axillary spikes, generally leafy at the base. May. *l.* broadly ovate, lower ones upon long stalks. Stem erect. *h.* 1½ft. to 2ft. Perennial; here and there naturalised in Britain. See Fig. 89.

A. tinctoria (dyers'). Alkanet. *fl.* deep blue; tube blood-colour; racemes usually twin, terminal, many-flowered. June. *l.* oblong, hispid. *h.* 6in. South Europe, 1596. A diffuse perennial.

ANCYCLOGYNE. A synonym of **Sanchezia.**

ANCYLOCLADUS. A synonym of **Willughbeia.**

ANDERSONIA (in honour of Messrs. Anderson, surgeons, great promoters of botany). ORD. *Epacridaceæ.* Elegant and delicate little greenhouse shrubs. Flowers terminal, solitary, or spicate; corolla sub-campanulate, hypocrateriform, five-lobed. The undermentioned, which is the only species yet introduced, grows freely in a sandy peat with perfect drainage, which latter is most essential. Cuttings from the tips of young shoots may be made in autumn, winter, or spring, and planted in sand in a gentle heat, with a bell glass placed over them.

A. sprengelioides (Sprengelia-like).* *fl.* pink, furnished with two small bracteas, spicate. March. *l.* spreading, bases curved inwards, so as to resemble a hood, ending in a flat point. *h.* 1ft. to 3ft. New Holland, 1803. Evergreen squarrose shrub. SYN. *Sprengelia Andersoni.*

ANDIRA (its Brazilian name). ORD. *Leguminosæ.* Large ornamental stove evergreen trees, nearly allied to **Geoffroya** (which *see* for cultivation). Flowers in axillary or terminal panicles. Pod drupaceous. Leaves alternate, unequally pinnate.

A. inermis (unarmed). *fl.* purple, on short pedicels; panicles terminal. *l.* impari-pinnate; leaflets thirteen to fifteen, ovate-lanceolate, acute, glabrous on both surfaces. *h.* 20ft. to 30ft. Jamaica, 1773. Known as the Cabbage Tree.

A. racemosa (branchy). *fl.* purple, in panicled racemes. *l.* impari-pinnate; leaflets thirteen, ovate-oblong, acuminated, glabrous on both surfaces. *h.* 20ft. to 60ft. Brazil, 1818.

FIG. 89. ANCHUSA SEMPERVIRENS.

ANDROCYMBIUM (from *aner*, a man, and *cymbos*, a cavity; the stamens are enclosed in a hollow formed by the folding of the limb of the petals). ORD. *Liliaceæ.* A peculiar greenhouse bulbous plant, requiring a light sandy soil, dry atmosphere, no shade, and a season of rest; during the latter period, scarcely any water is required. Propagated by seeds and offsets.

A. punctatum (dotted). *fl.* whitish, few, in a dense sessile umbel, surrounded by about four spreading lanceolate, acuminate leaves, which are 5in. to 6in. long, ½in. to ¾in. broad above the base, channelled down the centre from base to tip. South Africa, 1874.

ANDRŒCIUM. The male organ of the flower.

ANDROGYNOUS. Producing male and female flowers on the same spike.

ANDROLEPIS (from *aner*, a man, and *lepis*, a scale; referring to the scaly stamens). ORD. *Bromeliaceæ.* Stove evergreen epiphyte. For culture, *see* **Æchmea.**

A. Skinneri (Skinner's). *fl.* white. *h.* 1½ft. Guatemala, 1850. SYN. *Billbergia Skinneri.*

ANDROMEDA (named after the daughter of Cepheus, who was rescued from the sea monster by Perseus). ORD. *Ericaceæ.* A dwarf, hardy shrub, found in peaty bogs in the temperate and Arctic regions of the northern hemisphere. Sow seeds as soon as ripe in pots or pans, very thinly, in sandy peat soil, and place in a cool frame, giving plenty of air. Place the young plants out in spring. Layers, pegged carefully down during September, will generally take twelve months to make sufficient roots to allow

Andromeda—*continued.*

of their being separated, and thus become independent plants. For other species often included under this genus in catalogues, *see* **Cassandra, Cassiope, Leucothoë, Lyonia, Oxydendrum, Pieris,** and **Zenobia.**

A. polifolia (Polium-leaved). Wild Rosemary. *fl.* pinky white, drooping, sometimes tipped with red; corolla ovate, furnished with ovate, rather leafy imbricated bracteas, terminal, umbellate. June. *l.* linear-lanceolate, mucronulate, with the margins more or less revolute, quite entire, glaucous beneath, with an elevated rib, and reticulated veins. *h.* 1ft. The numerous varieties of this very beautiful native shrub principally differ in the colouring of the flowers.

ANDROPOGON (from *aner*, a man, and *pogon*, a beard; tufts of hair on flowers). ORD. *Gramineæ*. A large genus of grasses with polygamous flowers. The majority of species are of no horticultural value; several, however, are very ornamental subjects, and thrive well in a rich, deep soil. Easily propagated by seeds or by division of the roots. The South European kinds succeed in the open air if planted in a warm dry border.

A. citratum (Citrus-leaved). Synonymous with *A. Schœnanthus.*

A. Schœnanthus. Lemon Grass. *fl.* in threes; spikes imbricate, conjugate, panicled. A handsome species, the leaves of which emit a very fragrant odour when bruised. *h.* 2ft. India, 1786. Stove species. SYN. *A. citratum.*

Other species worth growing are *furcatus, halepensis, muricatus, pubescens, scoparius, squarrosus,* and *strictus.*

ANDROSACE (from *aner*, a man, and *sakos*, buckler; in reference to the resemblance of the anther to an ancient buckler). Including *Aretia.* ORD. *Primulaceæ.* Dwarf annuals or perennials, entirely alpine, agreeing in most characters with *Primula*, but having the tube of the corolla narrowed at the mouth. An airy, well-drained, and partially sunny position is essential in their culture. They thrive well between fissures of rocks or stones with a rich sandy peat soil. Drought and a sour soil are alike fatal, and both will be greatly obviated if small pieces of sandstone are mixed with the soil. The woolly species are best arranged beneath a jutting ledge of the rockery, which will afford them protection from the hottest sunshine, and from excessive wet in winter; additional comfort will be provided from the latter ill if a piece of glass is placed over them during the autumn and winter months. They can also be well grown, and make charming little specimens, in pots, with rich sandy soil and thorough drainage. Sprinkle sand among the small rosettes of leaves. They are increased by divisions, cuttings, or seed; the latter should be sown as early as possible, and raised in a frame.

A. alpina (alpine). *fl.* purplish rose; throat and tube yellow, solitary; peduncles about ½in. long. June. *l.* crowded, small, tongue-shaped, in small rosettes. *h.* 2in. to 3in. Switzerland, 1775. This species requires a rather shady aspect, and to be planted almost perpendicularly in a soil composed of leaf mould, peat, fibrous loam, and sharp sand. SYN. *A. glacialis.*

A. Aretia (Aretius'). Synonymous with *A. helvetica.*

A. aretioides (Aretia-like). Synonymous with *A. obtusifolia.*

A. argentea (silvery).* *fl.* white, sessile, very numerous. June. *l.* densely imbricated, lanceolate, oblong, covered with short hairs, forming very pretty silvery-grey rosettes. *h.* about 2in. Switzerland, 1826. This requires a well drained, sunny fissure. SYN. *A. imbricata.*

A. carnea (flesh-coloured).* *fl.* pink or rose, with a yellow eye, three to seven, on hairy stalked umbels. July. *l.* awl-shaped, smooth, acuminated, not forming rosettes. Stem somewhat elongated. *h.* 3in. or 4in. Switzerland, 1768. This forms charming little cushions if allowed to remain undisturbed; it is easily increased. SYNS. *A. Lachenalii, A. puberula.*

A. c. eximia (select).* Larger and more robust than the typical species, and a more rapid grower. Forms compact tufts of dense rosettes, bearing heads of rosy-crimson yellow-eyed flowers, on stems 2in. or 3in. high. Auvergne Alps, 1871. It requires moist sunny ledges and fissures of rockwork in peat, loam, and sand.

A. Chamæjasme (rock jasmine).* *fl.* blush, ultimately deep pink, with a yellow eye, umbellate. June. *l.* lanceolate, tapering to a point towards the base, in comparatively large, not dense, rosettes. *h.* about 2in. to 4in. Austria, &c., 1768. A very free flowering species, growing freely when established, ultimately forming large tufts. It thrives best in a deep, well drained and rich loam soil.

A. ciliata (ciliated). *fl.* deep carmine red, on stems double as long as the leaves. June. *l.* lanceolate-oblong, smooth on both surfaces, with ciliated margins, imbricated. *h.* 2in. to 3in., forming dense cushions. Pyrenees.

Androsace—*continued.*

A. coronopifolia (buckhorn-leaved).* *fl.* pure white, on slender pedicels, umbellate on peduncles, about 6in. high. April to June. *l.* lanceolate, distantly serrated, smooth, in flattish rosettes. Russia, 1755. This is a charming little annual, well worthy of a place on the rockery. A colony of it is extremely pretty; it seeds freely, and a batch of young plants almost invariably takes the place of the old ones. SYN. *A. septentrionalis.*

A. glacialis (glacial). Synonymous with *A. alpina.*

A. helvetica (Swiss).* *fl.* white, nearly sessile, with a yellow eye, larger than the little rosettes of leaves on the stalk from which they spring. May. *l.* lanceolate, obtuse, closely imbricated, small, ciliated. *h.* 1in., forming dense cushions. Switzerland, 1775. A rare little gem, requiring a partially shaded position, and very sandy soil. SYN. *A. Aretia.*

A. imbricata (imbricated). Synonymous with *A. argentea.*

A. Lachenalii (Lachenal's). Synonymous with *A. carnea.*

A. lactea (milk-white).* *fl.* pure white, with yellow throat, large, on long graceful stalks, umbellate. June. *l.* linear, or nearly so, in rosettes, sometimes scattered on the elongated branches. *h.* about 4in. Austria, 1752. Very floriferous and strong growing. Should have an eastern or western aspect, and be propagated from seeds. SYN. *A. pauciflora.*

FIG. 90. ANDROSACE LAGGERI.

A. Laggeri (Lagger's).* *fl.* pink, sessile; when approaching maturity the stem becomes elongated, and bears a tuft of stalked flowers. March. *l.* awl-shaped, sharply pointed, in tiny rosettes. *h.* 3in. Pyrenees, &c., 1879. Very like *A. carnea*, but more delicate, earlier, and more abundant flowering, with deeper green foliage. It suffers from exposure to the sun, and therefore requires a partially shady position. Should be propagated from seeds or cuttings, which latter strike freely. See Fig. 90.

A. lanuginosa (woolly-leaved).* *fl.* delicate rose, with a small yellow eye, umbellate. June to October. *l.* nearly 1in. long, clothed with shiny silken hairs. *h.* 6in. to 9in. Himalaya, 1842. A very beautiful species, with spreading or trailing shoots, easily multiplied by cuttings or layers. It requires a warm sunny spot on the rockery, with a sandy peat soil. When planted so that its shoots drape the face of a rocky ledge, it is one of the most charming plants possible to grow.

A. obtusifolia (blunt-leaved). *fl.* white or rose, with yellow eye; umbels five or six-flowered. Spring. *l.* lanceolate or rather spathulate, in rather large rosettes. Stems downy. *h.* 2in. to 6in. European Alps. A very pretty form, closely allied to *A. Chamæjasme*, and differing principally in its somewhat larger rosette of leaves and stronger growth. SYN. *A. aretioides.*

A. pauciflora (few-flowered). Synonymous with *A. lactea.*

A. penicillata (finely hairy). Synonymous with *A. villosa.*

A. puberula (puberulous). Synonymous with *A. carnea.*

A. pubescens (downy). *fl.* white, with a faint yellow eye, solitary, at the ends of the branchlets, very numerous. June. *l.* oblong-ovate, ciliated, in a crowded rosette. Stem with a small swelling close to the flower. *h.* 2in. Alps, 1869. Treat like *A. Chamæjasme.*

A. pyrenaica (Pyrenean). *fl.* white, with yellowish eyes, on a scape about ½in. high. Summer. *l.* narrow-oblong, ciliated, recurved, keeled at the back. *h.* 1in. Pyrenees. An exceedingly pretty and diminutive little alpine plant, grown, according to Mr. Robinson, "to great perfection in fissures between large rocks, with, however, deep rifts of sandy peat and loam in them. It will also grow on a level exposed spot, but in such a position should be surrounded by half-buried stones."

A. sarmentosa (trailing).* *fl.* bright rose, with a white eye, in umbels of ten to twenty, on an erect scape. May and June. *l.* very silvery, forming dense rosettes, whence spring a number of runners, bearing at their extremities other tufts, which should be pegged down and covered with soil, when they will root freely. Himalayas, 1876. It requires rich sandy loam, a sunny position, and to be wedged between pieces of sand-stone. Cover the rosettes during winter with a sheet of glass. See Fig. 91.

Androsace—*continued.*

A. septentrionalis (northern). Synonymous with *A. coronopifolia.*

A. villosa (hairy).* *fl.* rose or blush, with a deeper coloured eye, and a honey-like perfume, umbellate. May. *l.* narrow, oblong, covered with soft white down, chiefly on the under surface, in compact tufts. *h.* 2in. to 4in. Pyrenees, &c., 1790. When well grown, the flowers are produced in great abundance, almost covering the green cushions. Plant in a sunny fissure of the rockery, in sandy loam and leaf soil. SYN. *A. penicillata.*

FIG. 91. ANDROSACE SARMENTOSA, showing Habit, and the two kinds of Leaves, &c.

A. Vitaliana (Vital's).* *fl.* rich yellow, comparatively large; tube inflated at the middle, almost nestling among the leaves. May to July. *l.* linear, acute, greyish. Stems numerous. *h.* 1in. to 2in. Pyrenees, &c., 1787. When well grown, it produces flowers in abundance, and is the only species in cultivation having yellow flowers. A well-drained, sunny pocket is desirable, with a calcareous soil, covering the surface with nodules of sandstone. SYN. *Gregoria Vitaliana.*

A. Wulfeniana (Wulfen's).* *fl.* rosy or crimson, large. Summer. *l.* oval, acuminated, in dense rosettes. *h.* 2in. Styria. A very rare species in cultivation in this country.

ANDROSÆMUM. *See* **Hypericum.**

ANDROSTEPHIUM (from *aner*, a man, and *stephos*, a crown; some of the stamens are barren and petaloid, forming a corona). ORD. *Liliaceæ.* A very pretty little hardy bulb, of dwarf habit, allied to *Brodiæa.* It requires a rich sandy loam, in a sunny position, and may be propagated by offsets and seeds; the latter should be sown as soon as ripe in a cold frame. Plant 6in. deep, when it will require no protection in winter.

A. violaceum (violet). *fl.* violet blue, about 1in. long, three to six in an umbel, on pedicels about their own length; tube infundibuliform, about as long as the spreading segments; corona half as long. Spring. *l.* four to six, very narrow. *h.* 6in. Texas, 1874.

ANDRYALA (the meaning of this is unknown). ORD. *Compositæ.* These are pretty hardy evergreen herbaceous perennials, easily grown in ordinary well-drained garden soil. Increased by seeds and divisions in spring. Two species only are in cultivation.

A. lanata (woolly).* *fl.-heads* yellow, Hieracium-like. May. *l.* white, woolly, thick, oblong-ovate; radical ones stalked; upper ones sessile. Stems with a leaf at each joint. *h.* about 1ft. South Europe, 1732.

A. mogadorensis (Mogador). *fl.-heads* bright yellow, as large as a half-crown; disk bright orange. April. Morocco, 1871. This species is rare in cultivation.

ANEILEMA (from *a*, not, and *eilema*, involucre; in reference to the absence of the involucre). ORD. *Commelynaceæ.* Greenhouse and stove evergreen perennials, with generally a trailing habit. A genus resembling *Commelyna*, from which it is distinguished by the inflorescence being sub-paniculate, and the peduncles entirely

Aneilema—*continued.*

exserted from the bracts at the branching of the panicle. Flowers without any involucre. They thrive in a compost of loam, peat, leaf mould, and sand, well mixed. Increased by seeds and root divisions. There are a large number of species known to botanists.

A. biflora (two-flowered).* *fl.* blue; floral stalks two-flowered. July. *l.* lanceolate. Stem creeping; plant smooth. New Holland, 1820. Greenhouse species.

A. sinicum (Chinese). *fl.* pale blue; racemes about seven-flowered, alternate, placed in a panicle form. May. *l.* ligulate, acuminate. Stems branched, diffuse. *h.* 1ft. China, 1820. Greenhouse species.

ANEMIA (from *aneimon*, naked; in reference to the naked panicles of sporangia). Including *Anemidictyon.* ORD. *Filices.* A well-marked genus of stove and greenhouse ferns, chiefly confined to Tropical America. Capsules small, very abundant, forming a copiously-branched panicle, quite distinct from the leafy part of the frond. This genus of handsome dwarf-growing ferns is of easy culture, in a compost of fibrous peat, leaf soil, and sand. Several species are exceedingly pretty for fern cases. For general culture, *see* **Ferns.**

A. adiantifolia (maidenhair-leaved).* *sti.* 12in. to 18in. long, firm, naked. *fronds*, barren portion shortly-stalked, 6in. to 9in. long, 4in. to 6in. broad, deltoid, bi-tripinnate; pinnæ close, lanceolate, the lowest the largest; ultimate divisions oblong or linear-cuneate, the outer toothed, with a firm texture; panicle 3in. to 4in. long, the peduncle 1in. to 3in. long. West Indies, 1793. A very handsome stove fern.

A. ciliata (ciliated). Synonymous with *A. hirsuta.*

A. collina (hill). *sti.* 8in. to 12in. long, firm, erect, densely clothed with fine ferruginous hairs. *fronds*, barren portion sessile, 6in. to 12in. long, 2in. to 3in. broad, with about twelve sessile pinnæ on each side, which are 1in. to 1½in. long, and about ½in. broad, unequal-sided, obliquely-truncate below, blunt, sub-entire, with a sub-coriaceous texture; panicle 2in. to 3in. long, close, the peduncle 4in. to 6in. long. Brazil, 1829. Very rare stove species. SYN. *A. hirta.*

A. deltoidea (deltoid-like). Synonymous with *A. tomentosa.*

A. Dregeana (Drege's).* *sti.* 8in. to 12in. long, firm, slightly villose. *fronds*, barren portion sub-sessile, 8in. to 12in. long, 2in. to 3in. broad, about equal in width in the lower half, with eight to twelve pinnæ on each side, which are 1in. to 1½in. long, ½in. to ¾in. broad, ovate-deltoid, unequal at the base, the upper side sub-cordate, the edge inciso-crenate; panicle 3in. to 4in. long, the lower branches elongated; peduncle same length. Natal. Stove species.

A. flexuosa (wavy). Synonymous with *A. tomentosa.*

A. hirsuta (hairy). *sti.* 6in. to 12in. long, slender, naked. *fronds*, barren portion 2in. to 6in. long, 1in. to 3in. broad, sessile, oblong-deltoid, bipinnatifid; pinnæ in six to eight opposite pairs, 1in. to 1½in. long, ¼in. to ¾in. broad, varying from oblong, obtuse, sub-entire, truncate at the base on the lower side, to deeply pinnatifid with narrow divisions; panicle 1in. to 2in. long, close; peduncle 2in. to 6in. long, slender. Jamaica, 1704. Very handsome stove species. SYNS. *A. repens* and *A. ciliata.*

A. hirta (hairy). Synonymous with *A. collina.*

A. mandioccana (Mandioccan).* *sti.* 6in. to 12in. long, deciduously villose. *fronds*, barren portion 1ft. or more long, 2in. to 4in. broad, oblong-lanceolate, the lower half about equal in width; pinnæ in twenty or more close pairs, the point narrowed, but scarcely acute; edge finely serrulate, the upper base parallel with the stem, the lower obliquely truncate; rachis and surfaces finely pilose; texture sub-coriaceous; panicle very compound, 3in. to 4in. long; peduncle longer. Brazil. A very beautiful and distinct stove species.

A. Phyllitidis (Phyllitis-like).* *sti.* 6in. to 18in. long, straminеous, naked, or fibrillose. *fronds*, barren portion sessile, 4in. to 12in. long, 2in. to 8in. broad, ovate-oblong, simply pinnate; pinnæ in four to twelve sessile pairs, the lowest the largest, ovate, 1in. to 6in. long, ½in. to 2in. broad, the apex acute, the edge crenulate, the base rounded or cuneate, or unequal, with a firm texture; panicle dense, 3in. to 9in. long, the branches short; peduncles the same length. Cuba, Mexico, &c. SYN. *Anemidictyon Phyllitidis.* Greenhouse species.

A. P. lineata (lined). *fronds* with a yellowish-green central stripe down the pinnæ. South America, 1868.

A. P. plumbea (leaden). Synonymous with *A. P. tessellata.*

A. P. tessellata (tessellated). Pinnæ dark green, with bright green centre and leaden-grey border. Brazil, 1875. The forms of this species are numerous: *fraxinifolia* and *macrophylla* are names often met with, but only show slight deviations. They all have a more hardy constitution than the other species, and grow well in the greenhouse. SYN. *A. P. plumbea.*

A. repens (creeping). Synonymous with *A. hirsuta.*

Anemia—*continued.*

A. tomentosa (tomentose).* *sti.* 6in. to 12in. long, strong, erect, clothed with ferruginous hairs. *fronds*, barren portion 6in. to 12in. long, half as broad, ovate-deltoid, bipinnatifid or bipinnate; lowest pinnæ the largest, the blunt lobes ¼in. to ⅜in. long, ⅛in. broad, nearly entire; rachis and surfaces densely pilose, with a firm texture; panicle 4in. to 9in. long, loose; peduncle 1in. to 2in. long. Tropical America. Greenhouse species. SYNS. *A. deltoidea*, *A. flexuosa*, *A. villosa*.

A. villosa (hairy). Synonymous with *A. tomentosa*.

ANEMIDICTYON. *See* **Anemia.**

ANEMONE (from *anemos*, wind; the greater part of the species grow in elevated places, much exposed to the wind). Wind Flower. ORD. *Ranunculaceæ*. An extensive genus of very ornamental hardy perennials. The generic characters of Anemone proper are: Involucre of three cut leaflets, distant from the flower; calyx of five to twenty petal-like sepals; petals absent. Of sub-genus Hepatica: Involucre of three entire leaflets, just under the flowers; calyx of six to nine petal-like sepals; petals absent. For botanical purposes, they are both now included under the one generic name of Anemone; but in gardens the Hepaticas are frequently regarded as a distinct genus. They delight in a rich sandy loam, but most will thrive in ordinary garden soil. Some are suitable for borders, while others thrive best on the rockery, most of them preferring a damp and partially shady position. For the numerous varieties of *A. coronaria*, both double and single flowered, the soil can hardly be too rich, and the position, though open, should be a sheltered one, and well drained. The tubers may be planted early in October, about 6in. apart, and 3in. deep, various colours being intermixed, when a splendid effect is produced in the following spring. After flowering, the tubers should be taken up—say in June—and spread out thinly, in a shady, airy situation, until they are dry, when they should be thoroughly cleaned, and, if necessary, divided, and finally stored away in a cool place, in pots or boxes of dry sand until the planting season. Anemones make admirable pot plants if placed in a compost of two parts turfy loam, and one of leaf mould or rotten hotbed or cow manure, with about a sixth part of sharp gritty sand; but, if so grown, they should be protected through severe weather, and brought into warmth as required. The perennial species are propagated by root divisions or root cuttings, or by seeds, in autumn or early spring; the seeds are better sown as soon as ripe in pans in a cold frame. Some, such as *A. japonica*, are freely increased by division; while others, such as *A. narcissiflora*, are very slow; and the tuberous rooted ones, by root division and seeds. The best and most rapid means of propagating the invaluable varieties of *A. coronaria*, and also of obtaining new ones, is by seed. A careful selection of flowers, and skilful hybridising, will produce results commensurate with the trouble incurred. So soon as the seed ripen, they should be gathered and sown at once in a warm sheltered situation outside, or in pans under glass, covering lightly with sandy soil, and keeping moist. They are somewhat difficult to sow on account of a mass of cotton-like down which adheres closely to them; they should be thoroughly separated therefrom by rubbing them in dry sand. Of course, if the seed are sown at different times, plants will be produced which will flower at different periods, and a succession of bloom may be had from April to November—indeed, nearly all the year.

A. alba (white). *fl.* white; pedicel solitary; sepals five, obovate, very blunt. June. *l.* ternate or quinate; segments deeply toothed at top; those of the involucre stalked. *h.* 6in. Siberia, 1820.

A. alpina (alpine).* *fl.* variously coloured, sometimes white, white with the back purple, cream, yellowish or yellow with their backs paler; sepals six, spreading, elliptical, rarely ovate. May. *l.* sometimes smooth, sometimes clothed with long crowded silky hairs, biternate; segments pinnate and deeply serrated; involucre of the same form. *h.* 6in. Middle Europe, 1658. Very handsome alpine. Plant on the rockery in rich deep soil, with a damp situation. SYN. *Pulsatilla alpina*

A. a. sulphurea (sulphur).* *fl.* beautiful soft yellow, 2in. to 2½in. across when expanded, but they are usually cup-shaped; sepals

Anemone—*continued.*

six, covered with a silky down outside; anthers of a rich golden colour. May and June. *l.* radical, stalked, drooping, more than 1ft. long; leaflets pinnatifid, deeply toothed. A very beautiful form, thriving in ordinary garden soil, and a rather moist situation. See Fig. 92.

FIG. 92. ANEMONE ALPINA SULPHUREA, showing Habit and Flower.

A. americana (American). A synonym of *A. Hepatica*.

A. angulosa (angled).* *fl.* fine sky blue, over 2in. across, with numerous black anthers surrounding a tuft of yellow styles; sepals eight to nine, elliptical, spreading. February. *l.* palmately five-lobed; lobes serrated. *h.* 8in. to 12in. East Europe. A very fine species, twice the size of *A. Hepatica* in all its parts; it is well suited for the border or rockery, enjoying a deep rich soil. SYN. *Hepatica angulosa*.

A. apennina (Apennine).* *fl.* blue, 1½in. across; sepals ten to fourteen, oblong, obtuse, erect; pedicel one-flowered. March. *l.* binately pinnate; segments lanceolate, deeply-toothed, acute. *h.* 6in. England (naturalised here and there), and Southern Europe. An exceedingly pretty plant, with soft-looking feathery foliage. It thrives best under the partial shade of trees, where the flowers retain their colour longer. Tuberous rooted.

A. baldensis (Mount Baldo).* *fl.* white, clothed with adpressed hairs on the outside, and reddish tinged with blue; sepals eight to ten, oblong-oval; pedicels one-flowered. May. *l.* biternate; segments many-parted; lobes linear; involucral leaves multifid. *h.* 6in. Switzerland, 1792. *A. cærulea* is probably identical with this species. Shady parts of the rockery. Rare. Tuberous rooted.

A. blanda (fair).* *fl.* deep blue, nearly 2in. across; sepals nine to fourteen, narrow. Winter or early spring. *l.* triternate; segments deeply cut and acute; involucral leaves stalked, trifid, deeply cut. *h.* 6in. Eastern Europe. A very handsome early flowering plant. It requires a rich, light, and well drained sandy loam, and a warm, sheltered position. It closely resembles *A. apennina*, of which it is merely a form, with deeper blue flowers. Tuberous rooted.

A. caroliniana (Carolina). *fl.* purple or whitish, pubescent on the outside, on a long one-flowered pedicel; sepals ten to twenty, oblong-linear. May. *l.* ternate, with three-parted, or cut acutely-toothed lobes; involucral leaves trifid, with cut lobes. *h.* 9in. Carolina, 1824. A very slender and delicate plant. Shady parts of the rockery. Tuberous rooted.

A. cernua (drooping). *fl.* somewhat drooping, dark purple; sepals six, spreading, elliptical-oblong. May. *l.* pinnate, villous underneath; segments pinnatifid; lobes cut, oblong; scapes, petioles, and peduncles clothed with downy hairs. *h.* 6in. Japan, 1806. Rare.

A. coronaria (garland).* Poppy Anemone. *fl.* very various in colouring, solitary; sepals six, oval, approximate. April to May. *l.* ternate; segments multifid; lobules linear, mucronated; involucral leaves sessile, multifid. South Europe, 1596. This is

Anemone—*continued.*

FIG. 93. ANEMONE CORONARIA FLORE-PLENO.

one of the species from which the majority of "florists' varieties" have originated, which can be purchased at such a cheap rate, either in named varieties, or in mixture, and are invaluable for

FIG. 94. ANEMONE FULGENS.

spring flowering. It thrives best in a good loamy soil, and should be somewhat shaded from the mid-day sun. Tuberous rooted. See Fig. 93.

Anemone—*continued.*

A. decapetala (ten-petaled).* *fl.* cream white or pale sulphur, about 1in. to 2in. across, erect; sepals eight to twelve, oblong, spreading. May to June. *l.* tripartite, and freely divided into numerous linear-acute segments, of a deep green colour. *h.* 12in. to 18in. North-West America, &c. A pretty free-flowering species, suitable for naturalising in woods, &c. It is less ornamental than many others, but is very distinct.

FIG. 95. ANEMONE HEPATICA.

A. dichotoma (forked).* *fl.* white, with a tinge of red on the under side; sepals five, elliptical; pedicels many, usually bifid. May. *l.* three parted; lobes oblong, deeply-toothed at top; those of the involucrum sessile. *h.* 1½ft. Siberia, North America, &c., 1768. Border, or for naturalising in woods. SYN. *A. pennsylvanica.*

FIG. 96. FLOWER AND LEAF OF ANEMONE JAPONICA.

A. fulgens (shining).* *fl.* of a dazzling vermilion or scarlet, with a black central patch of stamens, about 2in. across; sepals obovate. May. Greece, South Europe, &c., 1865. A very beautiful variety, much more showy than *A. hortensis* (of which it is generally regarded as a variety), and a universal favourite. In "Hardy Perennials," Mr. Wood says of this splendid species: "It may be grown in pots for conservatory or indoor decoration. It needs no forcing for such purposes; a cold frame will prove sufficient to bring the flowers out in winter. Borders or the moist parts of rockwork are suitable for it; but perhaps it is seen to greatest advantage in irregular masses in the half shade of trees in front of a shrubbery; and, after all, it

Anemone—*continued.*

is impossible to plant this flower wrong as regards effect. To grow it well, however, it must have a moist situation and good loam." See Fig. 94.

A. Halleri (Haller's).* *fl.* purplish inside, large, erect; sepals six, oval-lanceolate. April. *l.* pinnate, very villous; segments three parted; lobes with lanceolate-linear, acuminated divisions. *h.* 6in. Switzerland, 1816. A sunny border or the rockery. SYN. *Pulsatilla Halleri.*

A. Hepatica (supposed remedy for liver diseases). Common Hepatica. *fl.* usually blue; sepals six to nine. February. *l.* cordate, three-lobed; lobes quite entire, ovate, acutish; petioles and scapes rather hairy. *h.* 4in. to 6in. There are numerous varieties of this species. England, &c. SYN. *Hepatica triloba.* Varieties: *alba* has large pure white flowers; *cærulea* (blue), the double form of *cærulea* is scarce and very showy; *rubra* produces reddish-pink flowers, and of which there is also a double variety, very bright and lasting; *Barlowi* has large sky-blue flowers. Besides these there are many others. They are all charming early spring-flowering plants, preferring rich light soil, and to remain undisturbed for years, when they form grand clumps, often producing seedlings where they stand. SYN. *A. americana.* See Fig. 95.

A. Honorine Jobert (Honorine Jobert) Synonymous with *A. japonica alba.*

A. hortensis (garden). Nearly approaches *A. coronaria*, the parent of a large number of garden forms. *A. fulgens* and *A. stellata* are by competent authorities placed as varieties.

A. Hudsoniana (Hudson's). Synonymous with *A. multifida.*

A. japonica (Japanese).* *fl.* rosy carmine, from 2in. to 2½in. across, on footstalks which spring from a whorl of three or four leaves; anthers golden yellow. Autumn. *l.* ternate, with unequally lobed, toothed segments. *h.* 2ft. to 3ft. Japan, 1844. See Fig. 96.

FIG. 97. ANEMONE JAPONICA ALBA.

A. j. alba (white).* This is a splendid variety, with a profusion of large pure white flowers, which are produced from August to November. This white form is one of the handsomest of border flowers. The blooms are 2in. to 3in. across, with a centre of dense lemon coloured stamens. For cutting purposes the flowers are invaluable. It thrives best in deep soil. SYN. *A. Honorine Jobert.* See Fig. 97.

A. j. elegans (elegant).* Very like *A. japonica*, with broader leaves, and pale rose-coloured flowers, which are more than 3in. across. This is also called *rosea* and *hybrida.* Japan.

A. lancifolia (lance-leaved). *fl.* white; sepals five, ovate-acute; scapes one-flowered. May. *l.* all stalked, ternate; segments lanceolate, crenate-toothed. *h.* 3in. Pennsylvania, 1823. Very rare. Rockery. Tuberous rooted.

A. multifida (many-cleft).* *fl.* red, whitish yellow, or citron colour, small; sepals five to ten, elliptical, obtuse; peduncles three, one-flowered, one of which is naked and earlier, the other two longer, and bearing two-leaved multifid involucels on their middle. June. *l.* radical ones ternate; segments cuneated, three parted, multifid, with linear lobes; those of the involucrum multifid, on short petioles. *h.* 6in. to 12in. North America. Border or rockery. SYN. *A. Hudsoniana.*

Anemone—*continued.*

FIG. 98. ANEMONE NARCISSIFLORA, showing Habit and Flower.

A. narcissiflora (Narcissus-flowered).* *fl.* usually cream coloured, sometimes purplish on the outside; umbels generally many-flowered; pedicels in some instances twice or three times longer than the involucrum, and in others very short; sepals five or six, ovate or oval, blunt or acute. May. *l.* radical ones palmately three to five parted; lobes deeply toothed; lobules linear, acute; those of the involucrum three to five cleft. *h.* about 1ft. Europe, North America, 1773. An extremely variable and beautiful species. Rockery. See Fig. 98.

A. nemorosa (grove).* Wood Anemone. *fl.* generally white; sepals six, elliptical; scapes one-flowered. March. *l.* ternate; segments trifid, deeply toothed, lanceolate, acute; involucral leaves stalked. *h.* 6in. This species varies greatly in the colour of its flowers. It is a most beautiful little plant, frequent in our native woods, and suitable for planting in shaded shrubberies, &c. Tuberous rooted.

A. n. cærulea (blue),* from the North-west States of America, is very near, if not identical with, the variety *Robinsoniana*, of our native woods.

A. n. flore-pleno (double-flowered).* *fl.* pure white, over 1in. across, solitary, double. This is an exceedingly pretty plant, and remains in beauty considerably longer than the type. It should be grown in large clumps, and in rich loam.

A. n. Robinsoniana (Robinson's).* *fl.* bright azure blue, large, over 1½in. in diameter. A charming variety for the rockery or border, and one of the prettiest in the whole genus.

A. n. rosea (rosy).* A very pretty form, with rose-coloured flowers, of which there is a double flowered sub-variety; there is also a double form of the type, named *bracteata fl.-pl.*, white flowers, surrounded with a large involucrum.

A. obtusiloba (blunt-lobed-leaved). *fl.* cream coloured; sepals five, obovate; peduncles two to three, one-flowered, villous, naked, or the lateral ones are bracteate. June. *l.* three lobed cordate, and are, as well as petioles, very villous; segments broadly cuneated, and deeply crenate; involucral leaves trifid. Himalaya, 1843. This species requires a warm and sheltered position.

A. palmata (palmate).* *fl.* golden yellow; sepals ten to twelve, oblong, obtuse; scape one, rarely two, flowered. May. *l.* cordate, sub-orbicular, bluntly three to five-lobed, toothed; involucral leaves trifid. South-west Europe, 1597. A white flowered variety, though scarce, is in cultivation, and is very pretty. True alpines, which should be grown on the rockery, where the soil is both rich and deep, with a somewhat damp situation. Tuberous rooted.

A. patens (spreading).* *fl.* purplish, or rarely yellow, erect, spreading, in the involucre almost sessile; sepals five to six. June. *l.* pinnate, rising after the flowers; segments three parted; lobes toothed at the top. Northern Europe, &c., 1752.

A. p. Nuttalliana (Nuttall's).* *fl.* purple, sometimes cream coloured, erect, villous on the outside; sepals five or six, erect, connivent. June. *l.* three parted; segments cuneate, trifid, cut; lobes linear-lanceolate, elongated; those of the involucre with linear lobes. *h.* 1ft. North America, 1826. A pretty border plant.

A. pavonina (peacock). Synonymous with *A. stellata.*

A. pennsylvanica (Pennsylvanian). Synonymous with *A. dichotoma.*

A. pratensis (meadow).* *fl.* dark purple, pendulous; sepals six, erect, reflexed at the top, acute. May. *l.* pinnate, many parted; lobes linear. *h.* 6in. to 12in. Northern Europe, &c., 1731. Differs chiefly from the following species in having smaller flowers, sepals narrower and more acute, connivent at base, and reflexed at apex. SYN. *Pulsatilla pratensis.*

A. Pulsatilla (common Pulsatilla).* Pasque Flower. *fl.* generally violet, sub-erect; sepals six, spreading, externally silky, very handsome. April. *l.* pinnate; segments many parted; lobes linear. *h.* 6in. to 12in. England, &c. A singular and beautiful species, thriving best in a dry situation and well-drained soil of

Anemone—*continued.*

FIG. 99. ANEMONE PULSATILLA.

a calcareous nature. It is a very pretty plant for a border or rockery; when well grown, it forms handsome tufts, and flowers very freely. See Fig. 99. SYN. *Pulsatilla vulgaris.* There are numerous varieties, the best of which are:

A. P. dahurica (Dahurian). *fl.* erect; sepals oblong, very villous. Plant dwarf. Sunny border or rockery.

A. P. lilacina (lilac). *fl.* lilac.

A. P. rubra (red). *fl.* erect; sepals blunter. Plant dwarfer.

A. ranunculoides (Ranunculus-like).* *fl.* usually yellow (but in the Pyrenean variety purple), generally solitary, single or double; sepals five to six, elliptical. March. *l.* radical ones three to five parted; segments subtrifid, deeply toothed; those of the involucrum on short stalks three parted, deeply toothed. *h.* 3in. Naturalised in English woods, but rarely. Tuberous rooted.

FIG. 100. ANEMONE STELLATA.

A. rivularis (river).* *fl.* white; anthers purple; sepals five, oval, smooth; pedicels three, one of which is naked. April. *l.* villous, as well as petioles, three parted; lobes cuneated, trifid; lobules

Anemone -*continued.*

cut, acutely toothed. *h.* 1ft. to 2ft. North India, 1840. Should be grown on the banks of running water, or in a damp situation in the border.

A. sibirica (Siberian). *fl.* white; sepals six, orbicular; scapes one-flowered. June. *l.* ternate; segments deeply toothed, ciliated, those of the involucrum on short stalks, ternate; segments lanceolate. *h.* 6in. Siberia, 1804. Rockery; very rare.

A. stellata (star-leaved).* *fl.* purple, or rose red, or whitish, solitary; sepals ten to twelve, oblong, bluntish. April. *l.* three parted; lobes cuneated, deeply-toothed; involucral leaves sessile, oblong. *h.* 8in. to 10in. South Europe, 1599. A pretty and gay spring flowering plant. Tuberous rooted. SYN. *A. pavonina.* Double forms of this occur in cultivation. See Fig. 100.

FIG. 101. ANEMONE SYLVESTRIS.

A. sylvestris (wood).* Snowdrop Windflower. *fl.* pure satin white, slightly drooping, 1½in. across when fully open, fragrant; sepals six, elliptical; pedicel solitary. April. *l.* ternate or quinate, hairy beneath; segments deeply toothed at top, those of the involucrum stalked. *h.* 6in. to 18in. Europe, 1596. This distinct and showy species thrives best in a light vegetable soil in a rather shady and moist situation. The roots are creeping, and should be allowed plenty of room, so that they may ramble without check. See Fig. 101.

FIG. 102. ANEMONE VERNALIS.

Anemone—*continued.*

A. trifolia (three-leaved). *fl.* white, erect; sepals five, elliptical, obtuse. April. *l.* all stalked, ternate; segments ovate-lanceolate, acute, toothed. *h.* 6in. France, 1597. This species comes close to *A. nemorosa.*

A. vernalis (spring).* *fl.* whitish inside, violet and covered with silky down outside, erect, sub-sessile or on pedicels; sepals six, straight, elliptic-oblong. April. *l.* pinnate; segments cuneate-lanceolate, trifid; involucrum very villous. *h.* 6in. Europe, 1816. A curious rather than a showy species; it makes a pretty pot plant, but must not, under any consideration, be allowed to want water. It can be plunged in sand or ashes in the open, and just as the flowers commence to expand, transfer to a cool frame. It thrives best in a peat and loam compost, to which small pieces of charcoal may be added. SYN. *Pulsatilla vernalis.* See Fig. 102.

A. virginiana (Virginian).* *fl.* purplish green or pale purple, small; sepals five, elliptical, silky-pubescent on the outside; pedicels often rising in pairs from the involucel. May. *l.* ternate; segments trifid, acuminated, deeply toothed; those of the involucre and involucels stalked; peduncles three to four, much elongated, middle one naked, sometimes 1ft. high; lateral ones bearing two-leaved involucels. *h.* 2ft. North America, 1722. Border or woodlands, and damp places.

A. vitifolia (vine-leaved). *fl.* white, villous on the outside; anthers copper colour; sepals eight, oval, oblong; pedicels one-flowered. July. *l.* large, cordate, five-lobed, beneath as well as the stems clothed with white wool; lobes broadly ovate, cut, and crenate; those of the involucrum stalked, woolly underneath, smooth above, bluntly cordate, five-lobed. *h.* 2ft. Upper Nepaul, 1829. This requires a warm sheltered position to stand the winter. Very near *A. japonica alba*, and probably the progenitor of it.

ANEMONOPSIS (from *anemone*, and *opsis*, resemblance; flowers like those of the Anemone). ORD. *Ranunculaceæ.* A handsome and remarkable hardy herbaceous perennial, not unlike *Anemone japonica*, but smaller. It thrives in any light soil. Propagated by seeds and divisions of the root-stock in spring.

A. macrophylla (large-leaved).* *fl.* in loose racemes; sepals about nine, concave, the outer three purple, internally pale lilac; petals twelve, in many rows, one-third the length of the sepals, linear-oblong. July. *l.* large, biternate, coarsely toothed, glabrous. *h.* 2ft. to 3ft. Japan, 1869.

ANEMOPÆGMA (from *anemos*, the wind, and *paigma*, sport). ORD. *Bignoniaceæ.* A handsome stove climbing shrub. For culture, *see* **Bignonia.**

A. racemosum (racemose).* *fl.* delicate buff coloured, in axillary racemes, large. September. Brazil, 1879. This beautiful and vigorous climber is, as yet, very rare in cultivation.

ANETHUM (from *ano*, upwards, and *theo*, to run; in reference to its quick growth). ORD. *Umbelliferæ.* A genus of erect glabrous annuals. Flowers yellow; involucre and involucels wanting. Leaves decompound, with linear-setaceous lobes. This genus is of no ornamental value, its most important species being the garden Dill (*A. graveolens*), which *see* for culture.

ANGELICA (in reference to the supposed angelic medicinal virtues of some species). ORD. *Umbelliferæ.* Perennial or biennial herbs. Flowers white; umbels terminal; involucra wanting or of few leaves; involucels of many leaves. Leaves bipinnate. The common Angelica (*A. Archangelica*) is the only species that calls for mention. It is a native biennial, and was at one time in much request for confectionery, and as a herb of supposed great medicinal value. Seed should be sown in September or March in ordinary soil, and the young plants thinned out to about 18in. apart.

ANGELICA TREE. *See* **Aralia spinosa.**

ANGELONIA (from *angelon*, the local name of *A. salicariæfolia* in South America). SYN. *Schelveria.* ORD. *Scrophularineæ.* Very pretty stove herbaceous perennials. Flowers axillary, racemose; corolla irregular, bilabiate; lower lip saccate at the base, trifid; upper one smaller, bifid. Leaves opposite. Stem and branches quadrangular. A mixture of light turfy loam, peat, leaf soil, and sand, is a good compost. Cuttings of young shoots in spring strike readily under a hand glass, or plunged in the propagating bed, giving plenty of air daily.

A. salicariæfolia (Willow-leaved).* *fl.* blue, hairy, axillary, solitary, pedicellate, disposed in terminal racemes. August. *l.* sessile, lanceolate, acute, serrated towards the apex, finely pubescent on both surfaces. *h.* 1½ft. to 3ft. South America, 1818.

ANGIOPTERIS (from *aggeion*, a vessel, and *pteris*, a wing). Including *Psilodochea.* ORD. *Filices.* A genus of gigantic greenhouse ferns. Capsules eight to fifteen, opening by a slit down the side, sessile, very close but not concrete, arranged in linear-oblong or boat-shaped sori near the edge of the frond. These ferns require a very liberal supply of water, and plenty of room to fully expand. The most suitable compost is a mixture of strong loam and peat, with some sharp sand. Thorough drainage must be afforded.

A. evecta (evectic). *cau.* erect, 2ft. to 6ft. high, 1½ft. to 2ft. thick, very fleshy. *sti.* swollen and articulated at the base, furnished with two large leathery persistent auricles. *fronds* 6ft. to 15ft. long, bi- or tripinnate; pinnæ 1ft. to 3ft. long, spreading, the lowest the largest; rachis swollen at the base; pinnules 4in. to 12in. long, ½in. to 1½in. broad, linear-oblong, sessile or shortly stalked, acuminate; edge entire or finely toothed. Tropics of Old World. This is the only clearly defined species; the others usually known as distinct species are but varieties of it, and its culture should not be attempted if plenty of room cannot be afforded it.

ANGOPHORA (from *aggos*, a vessel, and *phero*, to bear; in reference to the shape of the fruit). ORD. *Myrtaceæ.* Australian evergreen greenhouse ornamental trees or shrubs. Flowers corymbose; calyx five or six-cleft. Leaves large, opposite. A mixture of leaf soil, peat, and sand suits them well. Ripened cuttings will root in sandy soil under a hand glass in a cool house, in a few weeks.

A. cordifolia (heart-leaved).* *fl.* yellowish, corymbose, large. May. *l.* sessile, ovate, cordate at the base, glabrous. *h.* 7ft. to 10ft. New Holland, 1789.

A. lanceolata (lanceolate-leaved).* *fl.* white, corymbose. May. *l.* petiolate, lanceolate, acuminate, glabrous. *h.* 4ft. to 6ft. New Holland, 1816.

ANGRÆCUM (deduced from *angurek*, a Malayan name for air plants). ORD. *Orchideæ.* TRIBE *Vandeæ.* These are among the most beautiful of epiphytal orchids. One characteristic, both remarkable and peculiar, is the long, hollow, tail-like spur depending from the base of the lip. The flowers are produced on spikes from the axils of the leaves. The leaves are evergreen, and arranged in two rows, the one opposite to the other, and, in many kinds, being curved, give the plant a very graceful appearance. The fact of these plants producing their blooms during the winter—a period when flowers are generally scarce—considerably enhances their value. They usually continue six or eight weeks in perfection, or even more. The following table of night temperatures should be almost universally adhered to for all the species enumerated, except *A. falcatum*, which thrives best in a cool house. From November to February, 58deg. to 63deg.; March to May, September and October, 65deg.; June to August, 70deg. The day temperature should be 7deg. or 8deg. higher than that of the night. A compost of crocks, charcoal, and sphagnum is best. A layer of a few large crocks at the bottom of the pot or pan will be required; over these spread another layer of charcoal and smaller crocks, just enough to allow the roots to support the plant; so that the first pair of leaves will be, in large plants, about 4in. above the rim of the pot, or proportionately less in the case of small plants. When the plant is carefully adjusted in its proper position, and held there with one hand, the other hand should work in among the roots more crocks and charcoal, ceasing so to do when within 2in. of the rim; the remaining space must be occupied with fresh sphagnum, pressed firm (this is most essential) in a cone shape, which may be built up to within ½in. of the lower pair of leaves. Prior to potting, which ought to be done between February and April, water should be withheld for a short time; but give a good soaking immediately after the operation. In the process of repotting, clear the roots of the old moss, all rotten stems, and particles of decayed roots. If plants are potted as we have recommended, a thorough soaking once a week only, or if grown on blocks of wood, or in suspended baskets or pans, about twice weekly will be found sufficient. Excessive fumigation, drought, whether atmospherical

Angræcum—*continued.*

or at the roots, will cause the leaves to drop, and prevent any growth being made, in which case the plant ought to be lowered. If the stems have emitted but few roots, a ring of moss fastened round the stems, and kept constantly wet, will induce the plant to throw out additional roots, when the lowering may be proceeded with. To keep the plants free from insect pests, frequently sponge the foliage. Thrips generally prove very troublesome, and a moderate fumigation is needful, dislodging the insects that may be secreted low down in the centre of the plant, shortly before the operation, by dropping a little weak tobacco water or sulphur among them.

A. arcuatum (curved).* *fl.* white; racemes from the axils of the two-year-old leaves, two or three being produced from a single growth, about 6in. long, arching. *l.* about 4in. long, and ¾in. broad. Natal. SYNS. *Listrostachys arcuata. A.* (*Listrostachys*) *Sedeni* comes close to the above species, but is excessively rare in cultivation.

A. bilobum (two-lobed).* *fl.* white, with a tinge of rose, about 1½in. in diameter; spur 2in. long, produced from the side of the stem, just above the two-year-old leaves; racemes pendulous, 6in. or more long, bearing about a dozen flowers, which possess a slight fragrance. October to December. *l.* 4in. long by 2in. broad, two-lobed at the apex, about eight on a plant. Stem erect, about 6in. high. Cape Coast, 1841. Should be grown in a basket.

A. caudatum (tailed). *fl.* greenish yellow, mixed with brown; labellum pure white; spur thick, pale green, about 9in. long, two-lobed at the lowest portion; racemes arching, 1ft. or more long, produced from the base of the two-year-old leaves. Autumn. *l.* pale green, drooping, about 10in. long by 1in. broad. *h.* 1½ft. Stem erect, or nearly so. Sierra Leone, 1834.

A. cephalotes (capitate).* *fl.* white. Tropical Africa, 1873.

A. Chailluanum (Chaillu's).* *fl.* white; sepals and petals narrow, acute; spur yellowish green, 4in. or more long; racemes pendulous, 8in. or 10in. long, about twelve medium sized flowers produced from the side of the stem, just above the axils of two-year-old leaves. *l.* 6in. long, 1½in. broad, slightly wavy, two-lobed at the apex, arranged in an imbricate manner. West Africa, 1866. A rare species.

A. Christyanum (Christy's). A curious species, with yellow or greenish-white flowers, having a much developed three-lobed lip. The plant has the aspect of *A. arcuatum.* 1880.

A. citratum (citron-like).* *fl.* creamy white, or pale yellow, nearly 1in. in diameter; spurs about 1½in. long; racemes three, on strong plants, produced from the axils of two-year-old leaves, arched, about 1ft. long, bearing sometimes twenty flowers. *l.* 4in. to 6in. long and 2in. broad, six or eight on a plant, occupying about 1½in. of stem. Madagascar, 1868. Habit compact; stem nearly erect.

A. distichum (two-rowed-leaved). *fl.* whitish, ¼in. across, on one-flowered pedicels, which are produced from the axils of the leaves. *l.* very short, closely imbricated, deep bright green. *h.* 6in. Sierra Leone, 1834. A very neat growing little species, and quite distinct.

A. eburneum (ivory-lipped).* *fl.* sepals and petals greenish white; lip uppermost, white, very large; racemes about 18in. long, from the axils of two-year-old leaves; footstalks erect, but gradually becoming pendulous from the commencement of the flowers. *l.* 20in. long by 2in. broad, light green, stiff. Madagascar, 1826. SYN. *Ærobion eburneum. A. virens* is an inferior variety, but *A. e. superbum* surpasses the type in beauty; it is, however, at present extremely rare.

A. Ellisii (Ellis's).* *fl.* pure white, fragrant, about 2in. across, with narrow reflexed sepals and petals, the column standing very prominent; spur pale brownish, 6in. to 8in.; racemes frequently 2ft. long, on the side of the stem just above the axils of the two-year-old leaves, bearing about twenty blossoms. *l.* dark green, 9in. or 10in. long, and 2in. broad, divided at the apex into two unequal lobes. Madagascar, 1879.

A. falcatum (sickle-shaped).* *fl.* pure white, very fragrant; spur upcurved, 2in. long; racemes from the axils of the two-year-old leaves, short, bearing from two to five blooms. *l.* 2in. to 4in. long, very narrow and fleshy, dark green. 1815. An elegant little cool house species, and one of the smallest belonging to this genus. It should be grown in peat, in a basket or small pot suspended about 2ft. from the glass, but rather shaded.

A. Kotschyi (Kotschy's).* *fl.* yellowish white, perfume similar to the common white pink, 1in. to 1½in. across; spur reddish-tinted, 6in. or 7in. long, distinguished by the two spiral twistings; racemes from the axils of the lower leaves, 18in. long, bearing about twelve blossoms. *l.* 6in. long by 3in. broad, of which there are generally six or more on a good plant. Zanzibar, 1880. Should be grown in a basket, or on a cylindrical block of teak wood.

A. modestum (modest).* *fl.* pure white, 1in. to 1½in. across. *l.* distichous, 3in. to 6in. long, 1in. to 1½in. broad, elliptic or linear-oblong, acute, tip entire, pale bright green, leathery, nerveless. Stem short. Madagascar, about 1880.

Angræcum—*continued.*

A. pellucidum (transparent).* *fl.* white, of a delicate semi-transparent texture, and with a finely fringed labellum; racemes from the axils of the lowest leaves, hanging perpendicularly from the stems, about 1ft. long, bearing thirty to forty blossoms. *l.* 12in. long by 2in. or 3in. broad. Sierra Leone, 1842. Must be grown in a suspended basket.

A. pertusum (broken).* *fl.* pure white; spur comparatively short, with a well-marked yellow tinge; racemes from the axils of two-year-old leaves, horizontal, or slightly nodding, 6in. to 7in. long, with from forty to sixty densely packed, small blossoms. *l.* dark green, arching, 10in. long by 1in. broad. *h.* 1ft. Sierra Leone, 1836. Very distinct and attractive.

A. Scottianum (Scott's).* *fl.* pure white, very delicate in texture, the lip is uppermost, 1in. or more across; spur narrow, yellowish, 3in. to 4in. long; peduncle slender, a little longer than the spur, usually but one-flowered. *l.* narrow, terete—thus differing from most of its congeners—tapering or awl-shaped, about 4in. long, ⅛in. to ¼in. in diameter, channelled in the upper surface and ridged below. Comoro Islands, 1878.

A. Sedeni (Seden's). A rare form of *A. arcuatum.*

A. sesquipedale (foot-and-a-half).* *fl.* beautiful ivory white, on stout, solitary, axillary peduncles, with sepals and petals spreading out like rays, from 6in. to 8in. across; the whip-like spur or nectary hangs down from the labellum, often from 10in. to 18in. long. November, December, and January, and lasts about three weeks in beauty. *l.* dark green, distichous, about 10in. long. *h.* 1ft. Madagascar, 1823. It is one of the grandest of winter flowering orchids.

A. virens (green). An inferior variety of *A. eburneum.*

ANGULAR. Having angles, or forming angles.

ANGULOA (commemorative of Angulo, a Spanish naturalist). ORD. *Orchideæ.* A small genus containing about six species. The flowers, which are large and beautiful, are borne singly on scapes from 12in. to 16in. high, several of which are produced from the ripened pseudo-bulbs of the preceding year's growth. Pseudo-bulbs from 5in. to 8in. high, as thick as a man's wrist, bearing two to three erect, broad, lanceolate leaves, 2ft. to 4ft. long. Temperature, summer, day (maximum), 70deg.; night (minimum), 60deg. Winter, day (maximum), 60deg.; night (minimum), 45deg. These are bold growing cool-house plants, best grown in rough fibrous peat, with good drainage. They delight in an abundant supply of water both to the roots and foliage when growing, and require to be kept in a somewhat dark or heavily-shaded place. During the season of rest, and until young shoots commence growth, they should be kept rather dry. They are propagated by dividing the pseudo-bulbs, just before they commence to grow. The flowering season is summer.

A. Clowesii (Clowes's).* *fl.* fragrant; sepals and petals concave, clear golden yellow; lip pure white; whole conformation globular, or tulip-like. Columbia (at 5000ft. to 6000ft. elevation), 1842. This is the largest growing species, of which there are one or two rare varieties.

A. eburnea (ivory-flowered).* *fl.*, sepals and petals of the purest white; lip spotted with pink. New Grenada. In other respects similar to above, but is very rare.

A. Ruckeri (Rucker's).* *fl.*, sepals and petals yellow, with crimson spots; lip deep crimson. Columbia, 1845. Not so large a grower as either of the foregoing, but with same sized flowers.

A. R. sanguinea (bloody).* This variety has flowers of a deep blood red colour, but is rare.

A. superba (superb). Synonymous with *Acineta Humboldtii.*

A. uniflora (one-flowered).* *fl.* sub-globose, pure white, sometimes freckled with brown, spotted profusely with pink inside. Columbia, 1844. One of the best in cultivation.

ANGURIA (one of the Greek names for the cucumber). ORD. *Cucurbitaceæ.* A stove genus of evergreen climbers allied to *Momordica.* Flowers monœcious; corolla joined to the calyx, ventricose, red, with a five-parted spreading border. Fruit somewhat tetragonal. Several species have been introduced from time to time, but they are rarely seen in our gardens. Some of them are handsome plants, and well worthy of cultivation.

ANHALONIUM. *See* **Mammillaria.**

ANIGOZANTHUS (from *anoigo*, to expand, and *anthos*, a flower; in reference to the branching expansion of the flower stalks). SYN. *Schwægrichenia.* ORD. *Hæmodoraceæ.* Greenhouse or half-hardy perennial herbs. Flowers large, racemose or corymbose; perianth tubular,

Anigozanthus—*continued.*

elongated, woolly. Leaves linear ensiform. The species thrive in a turfy compost of peat and loam, three parts of the former to one of the latter; the whole intermixed with sand to make it porous. In the growing season they must be kept well watered, and somewhat dry during their period of rest in winter. They are very easily propagated by dividing the roots in spring.

A. coccineus (scarlet).* *fl.* scarlet; perianth swelling towards the summit, hairy, segments a little reflexed; disposed in dichotomously-forked panicles; pedicels rather long. June. *l.* lanceolate, deep green. Stem ciliated. *h.* 5ft. Swan River, 1837.

FIG. 103. INFLORESCENCE AND LEAF OF ANIGOZANTHUS FLAVIDUS.

A. flavidus (yellowish-green-flowered).* *fl.* yellowish green, panicled; scapes long. May. *l.* lanceolate, smooth, as is also the stem; down of branches deciduous. *h.* 3ft. New Holland, 1808. There is a scarlet and green-flowered variety of this species. See Fig. 103.

A. Manglesii (Mangles'). *fl.* green; stigma capitate, projecting beyond the tube, in a short terminal spiked raceme. May. Stem erect, clothed with short thick crimson persistent velvety down. *h.* 3ft. Swan River, 1833.

A. pulcherrimus (beautiful).* *fl.* yellow; panicles much branched, clothed with rufous bristles. May. *l.* equitant, linear falcate, covered with stellate tomentum. *h.* 3ft. Swan River, 1844.

Anigozanthus—*continued.*

A. tyrianthinus (purple).* *fl.* purple and white; panicle clothed with purple tomentum. May. *l.* linear, stiff, straight, glabrous. Stem tall, ternate, panicled, clothed with hoary tomentum below. *h.* 3ft. Swan River, 1844.

ANIL. *See* **Indigofera Anil.**

ANIME RESIN. *See* **Hymenæa Courbaril.**

ANIMATED OAT. *See* **Avena sterilis.**

ANISANTHUS. *See* **Antholyza.**

ANISE (*Pimpinella Anisum*). A hardy annual, occasionally used for garnishing or seasoning. Sow seed, in ordinary garden soil, on a warm sunny border, in May, where it is intendedfor the plants to remain.

ANISEED TREE. *See* **Illicium.**

ANISOCHILUS (from *anisos*, unequal, and *cheilos*, a lip; in reference to the inequality of both lips of calyx and corolla). ORD. *Labiatæ*. A very ornamental genus of stove perennials or biennials. Whorls of flowers densely imbricate into oblong cylindrical spikes; corolla with an exserted, defracted tube, inflated throat, and bilabiate limb. They thrive in any light rich soil. Cuttings will root in a sandy soil under a bell glass, in heat; seeds may be sown in February in heat.

A. carnosum (fleshy). *fl.* lilac. June to September. *l.* petiolate, ovate-roundish, obtuse, crenated, cordate at the base, thick, fleshy, tomentose on both surfaces. Stem erect. *h.* 2ft. East Indies, 1788.

ANISODUS. A synonym of **Scopolia.**

ANISOMELES (from *anisos*, unequal, and *melos*, a member; in reference to the anthers of the longer stamens being halved). ORD. *Labiatæ*. Ornamental greenhouse or evergreen stove shrubs, herbaceous perennials, or annuals. Whorls sometimes densely many-flowered, at others few, and loose; corolla with upper lip erect, oblong, entire; lower lip larger, spreading, and lateral lobes ovate, obtuse. They are of very easy culture in light rich soil; young cuttings strike freely in spring, in heat, under a bell glass. *A. furcata* requires little or no artificial heat, but the protection of a bell glass is beneficial. Seeds of *A. ovata* may be sown in spring, in heat, and, after due hardening off, the seedlings may be planted outside in May.

A. furcata (forked).* *fl.* small, elegantly variegated with white, red, and purple, in loose many-flowered racemose cymes. July. *l.* petiolate, ovate, acuminated, crenated, cordate at the base, hispid on both surfaces. *h.* 4ft. to 6ft. Nepaul, 1824.

A. malabarica (Malabar). *fl.* purplish; whorls distant, many-flowered, dense. July. *l.* oblong-lanceolate, 2in. to 4in. in length, obtuse, serrately crenated in the upper part, quite entire at the base. *h.* 2ft. to 5ft. Tropical Asia, in humid places, 1817. Shrub.

A. ovata (ovate-leaved).* *fl.* purple; lower lip of a deeper colour; whorls many-flowered, lower ones distant, upper ones interruptedly spicate. August. *l.* ovate, obtuse, broadly crenated. *h.* 2ft. to 3ft. Nepaul, 1823. An annual. Habitat similar to last.

ANISOMEROUS. Unequally-parted; unsymmetrical.

ANISOPETALUM. *See* **Bulbophyllum.**

ANNUALS. All plants which spring from the seed, flower, and die within the course of a year. A number of things, however, which are not strictly of annual duration, but which are sown every year in preference to housing the roots before they are killed by late autumn or winter frosts, are generally classed, for the sake of convenience, under the head of Annuals. Hardy Annuals are those which require no artificial aid to enable them to develop, but grow and flower freely in the open air. These are

Annuals—*continued.*

best sown in the spots where they are intended to remain during March and April, and care must subsequently be taken to keep the ground clear of weeds, and also to thin out the seedlings, allowing each sufficient room to develop and exhibit its true character. If allowed to remain too crowded, the plants, as a matter of course, suffer, and the size and number of the flowers and the general effect are considerably decreased. Successional sowings of a good many of the showy species will be found to prolong their flowering season. In well-kept establishments, where Annuals are duly appreciated, several sowings are made in pots at intervals of a few weeks. As the previously-sown clumps begin to get shabby, they are removed, and replaced by others which have still to flower. By this means a continual sheet of blossom can be maintained for a long time. It is much better to trust to plants grown in pots in order to carry out the plan just sketched, as these receive no check when placed in their new quarters; whilst transplanted clumps frequently fail, and many species do not transplant at all readily from an open border. In order to secure, in early spring, a fine show of such plants as several of the *Silenes*, *Myosotis*, *Saponaria*, and a number of others, it is best to sow the seeds in an open, sheltered border, about the end of July or beginning of August, taking care to keep a small reserve stock in a cold frame, in case very severe weather kills the unprotected plants. Half-hardy Annuals are those for which our climate is not sufficiently warm, or, rather, our summer is not, as a rule, either hot enough or long enough, to allow them to grow, flower well, and ripen seeds, if sown in the open air. Many of these are amongst the showiest of garden plants, so it is worth while to give them the shelter of a warm frame during their earlier stages, and gradually harden them off, planting out at the end of May or beginning of June, when danger resulting from severe weather is passed. After germination, the seedlings should have plenty of light and air, or a weak, spindly growth, and, as a consequence, poor flowers, will result. The most satisfactory method of watering very tiny seeds is to place a piece of fine muslin over the seed-pot, through which the water will be easily conveyed to the seeds, and thus prevent disturbance. Tender Annuals require the same treatment as the half-hardy ones, except that they need throughout their existence the protection of a glass structure. All, or nearly all, garden Annuals delight in full sunlight and plenty of air. In the open, these requirements, as a rule, obtain, but sometimes mistakes are made under glass by keeping the plants too close and over much shaded, as well as too great a distance from the glass.

ANNULAR. Having a ring-like form.

ANNULATE. With the appearance of rings.

ANŒCTOCHILUS (from *anoiktos*, open, and *cheilos*, a lip; in reference to the spreading apex of the lip). SYNS. *Anecochilus*, *Chrysobaphus*. ORD. *Orchideæ*. Stove terrestrial orchids, the radical leaves of which are the chief attraction, being amongst the most beautiful and delicate objects in the vegetable kingdom. The flowers, which should be pinched off so soon as they appear, are, as a rule, small and unattractive. Few of the species exceed 6in. in height, with leaves from 2in. to 6in. long, including the fleshy petioles. They require a good deal of attention. To one part of silver sand, thoroughly washed twice or three times, add two of sphagnum, which should also be well washed and picked over, when it should be chopped into minute particles, in order that it may freely amalgamate with the sand; mix a little loam and peat with the whole. In the pots, when well drained by first placing a large piece of potsherd over the bottom and nearly half filling up with pieces broken small and of uniform size, place a thin layer of crude sphagnum, afterwards filling firmly with the mixture above mentioned, and bringing it up more or less in the form of a cone above

Anœctochilus—*continued.*

the rim of the pot, into which the plants should be firmly fixed. Plants which have been propagated by division should be carefully transferred to 32-sized pots. About five separate pieces might be placed evenly over the surface. Make holes with a neat dibble, and into these drop the roots their entire length, pressing the soil firmly with the dibble. Fix them so that they may grow inwardly, and not out over the rim of the pots, pegging each creeping root needing such attention firmly down upon the surface of the soil afterwards; after a good soaking, they may be replaced in any warm, shady situation. For propagating, a strong plant is necessary; it may be cut into pieces just below the first joint, each piece having a root. The bottom piece should have two eyes—one to root from, and the other to push into a shoot. The "bottom," or plant which has been cut, should be replaced in its pot, and then put under a bell glass. It will soon throw up a young shoot; this ought to be left on until well rooted, when it may be separated and treated similarly to the portion first removed, still leaving the old part in the pot. These plants

FIG. 104. ANŒCTOCHILUS FRIDERICI-AUGUSTI.

must be grown in glass cases, or under bell glasses, but they should always have a little air, for, as Mr. Williams says, when too much confined, they grow up spindly, and damp off in the stem; the latter, being fleshy, requires more substance and sturdiness. Air should be admitted through a space of about 1in. or 2in. The following ranges of temperature are advised: Winter, night, 55deg. to 60deg.; day, 65deg. to 70deg. during March, April, and May; night, 60deg. to 70deg.; and, afterwards, a few degrees higher, with a maximum day temperature of 80deg. Bottom heat should not be given, as it induces a weak, fast growth. Great care will be needed to prevent ravages of insects. The most suitable month for repotting is March, just before growth commences, when the plants will need plenty of water up to October, excepting when it is desirous to utilise them as drawing-room ornaments, in which case they should be kept rather dry for a short time previous. *See also* **Dossinia**, **Goodyera**, **Hæmeria**, **Macodes**, **Physurus**, and **Zeuxine**.

A. argenteus pictus (silvery-painted). A synonym of *Physurus pictus*.

Anœctochilus—*continued.*

A. argyroneurus (silvery-veined).* *l.*, light green, dark mottled; veins forming a beautiful silvery network. Java.

A. Boylei (Boyle's).* *l.* ovate, acuminate, 2in. long and broad, olive-green, netted and pencilled with gold. India.

A. Bullenii (Bullen's).* *l.* 2½in. long, ground colour bronzy green, with three broad distinct lines of coppery-red, or golden stripes running the entire length. Borneo, 1861.

A. concinnus (neat). *l.* ovate, acuminate, rounded at base, dark olive-green, netted and striped with shining coppery-red. Assam.

A. Dawsonianus (Dawson's).* *l.* ovate, of a dark velvety, rich olive-green, traversed by about seven longitudinal copper-coloured veins; the space on each side of the midrib being filled with fine reticulations of the same colour. Malay Archipelago, 1868. The proper name of this plant is *Hæmeria discolor Dawsoniana.*

A. Dayi (Day's). A synonym of *Dossinia marmorata Dayi.*

A. Dominii (Dominy's). *l.* dark olive-green, streaked down the centre with pale coppery-yellow, the main ribs marked by pale lines. Hybrid between *Goodyera discolor* and *A. Friderici Augusti.*

A. Eldorado (Eldorado). *l.* dark green, with small tracery of a lighter colour, deciduous. Central America.

A. Friderici-Augusti (Frederick Augustus').* *l.* 2½in. long, and 1½in. broad, dark velvety green, with broad orange and green stripes down the centre, covered with a beautiful golden network. *h.* 5in. Very distinct. See Fig. 104. SYN. *A. xanthophyllus.*

A. Heriotii (Heriot's). *l.* 3½in. long, 2½in. broad, dark mahogany-colour, golden-reticulated, and with shadowy network. India.

A. hieroglyphicus (hieroglyphic-marked). *l.* small, dark green, with hieroglyphic-like, silvery-grey blotches. Assam.

A. intermedius (intermediate).* *l.* 2½in. long, and 1½in. broad, with a silky surface, dark olive, striped and veined with gold. *h.* 3in. Will succeed with a glass covering, in a stove, if shaded.

A. javanicus (Java). *fl.* pink, small, spicate; scape 9in. high. *l.* 2in. long, 1½in. broad, dark olive-green, with lighter blotches and faint golden reticulation, pinkish beneath. Java.

A. latimaculatus (broad-spotted).* *l.* dark green, with silvery markings. Borneo. A distinct and free-growing kind.

A. Lowii (Low's).* *l.* 4in. to 5in. long, 3in. broad, dark velvety-green, shading to orange-brown, lined from base to apex with deep golden veins, crossed by lines of the same hue. *h.* 6in. Borneo. The correct name of this plant is *Dossinia marmorata.*

A. L. virescens (greenish).* *l.* brighter green, with brighter markings over the whole surface.

A. Ordianus (Ordi's).* *l.* shape and habit of *A. Dawsonianus*, but the colour is a vivid green, and lined with golden veins. Java, 1869. The proper name of this plant is *Hæmeria discolor Ordiana.*

A. pictus (painted). A synonym of *Physurus pictus.*

A. querceticola (forest-dwelling). A synonym of *Physurus querceticolus.*

A. regalis (royal).* King Plant. *l.* 2in. long, 1½in. broad; surface a beautiful velvety green, veined in regular lines, and covered with a network of gold. *h.* 4in. Java, 1836. If examined with a lens in sunshine, the beauty of the network will be plainly seen. SYN. *A. setaceus* (of gardens). There are several varieties, the best of which are:

A. r. cordatus (heart-shaped). *l.* rounder, and gold markings broader. Very rare.

A. r. grandifolius (large-leaved).* *l.* light green, beautifully laced and banded with a network of gold. Also rare.

A. r. inornatus (unadorned). *l.* dark rich velvety, with a few slight markings, destitute of the golden reticulation. Java.

A. Reinwardtii (Reinwardt's).* *l.* rich, deep velvety-bronze, intersected with bright golden lines. Java.

A. Roxburghii (Roxburgh's).* *l.* 2½in. long, 1½in. broad, dark velvety-green, striated with well-defined lines of silver. *h.* 3in. India. The true species is very rare; several are sold as such.

A. Ruckerii (Rucker's).* *l.* broadly ovate-bronzy-green, with six rows of distinct spots running from base to apex. Borneo, 1861.

A. setaceus (bristly). A garden synonym of *A. regalis.*

A. striatus (striated). A synonym of *Zeuxine regia.*

A. Turneri (Turner's).* *l.* large, rich bronze, freely golden-reticulated. One of the handsomest; a very free grower.

A. Veitchii (Veitch's). A synonym of *Macodes Petola.*

A. xanthophyllus (yellow-leaved). A synonym of *A. Friderici-Augusti.*

A. zebrinus (striped).* *l.* ovate-lanceolate, deep olive green, with copper-coloured veins. India, 1863. Dwarf and elegant.

ANOMATHECA (from *anomos*, singular, and *theca*, a capsule, or seed-pod). ORD. *Irideæ.* Very pretty little bulbous perennials. Perianth hypocrateriform; tube triquetrous, constricted at the throat. The species are hardy when planted in warm sunny situations in the open border. Their dwarf stature, brilliance, profusion of flowers, and habit of blossoming continuously over a long period, render them very popular subjects amongst

Anomatheca—*continued.*

growers of hardy perennials. Although generally credited with being hardy, when cultivated out of doors they should be lifted and stored in frostproof quarters before winter commences, until the following March. They are excellent as window garden plants, and also for pot culture. If grown in pots, they should be shaken out, and repotted in February or March. They multiply very rapidly, and may be divided in patches, not by single bulbs, once yearly. Light sandy loam, mixed with a little leaf mould, is the best compost. Anomathecas are sometimes increased by seed, which may be sown so soon as ripe, very thinly, in seed pans. Thin out the seedlings if growing very close together; the next season they may be put out four or five in a pot. When they become crowded, shift into a much larger pot, but do not disturb the ball. The young seedlings will probably produce flowers the second season.

A. cruenta (bloody).* *fl.* rich carmine-crimson; perianth segments elliptical, three lower ones broader than the others, with a dark blotch at the base; tube long, whitish; scapes secund, bearing about five or six flowers. Summer and autumn. *l.* two-ranked, about ½in. broad, sword-shape, somewhat tapering. Bulb ovate, rather large. *h.* 6in. to 12in. Cape of Good Hope, 1830.

A. juncea (rushy). *fl.* very bright pink, with a dark spot at the base, produced in profusion. The leaves are narrower than those of the foregoing. Cape of Good Hope, 1791. A rare species.

ANONA (*Anona* is the name applied to these plants in St. Domingo). Custard Apple. ORD. *Anonaceæ.* Stove evergreen shrubs, with fragrant leaves. Petals six, in two rows. Carpels indefinite, joined into one fleshy, many-celled, edible, roundish fruit, with a muricated, scaly, or reticulated skin. Anonas thrive best in rich loamy soil, mixed with a little peat. Ripened cuttings, with leaves intact, will root if inserted in sand and placed under a hand glass, in a moist heat. When seeds are procurable, they should be sown in pots, and plunged into a hotbed.

A. Cherimolia (The Cherimoyer). *fl.* outer petals somewhat concave, linear-oblong, brown on the outside, each marked with a dark spot at the base; peduncles opposite the leaves, solitary. July. *fr.* somewhat globose and scaly, dark purple; esteemed by the Peruvians as one of their most delicate, and as being not inferior to any fruit in the world. *l.* ovate-lanceolate, not dotted; under surface silky tomentose, strong scented. *h.* 20ft. Peru, 1739.

A. glabra (smooth-fruited).* *fl.* outer petals ovate, obtuse, brown; calyx leathery, large; peduncles opposite the leaves, two-flowered. July. *fr.* greenish-yellow, conoid, blunt, smooth. *l.* ovate-lanceolate, smooth. *h.* 10ft. West Indies, 1774.

A. longifolia (long-leaved). *fl.* purplish; outer petals concave, thick, all acute, large, axillary, solitary, stalked. May. *fr.* ovate-globose, dotted, and reticulated, flesh-coloured. *l.* oblong, acuminated, mucronate, smooth. *h.* 20ft. Guiana, 1820.

A. muricata (muricated-fruited).* The Sour Sop. *fl.* outer petals cordate, concave, thick, acuminated, green on the outside, yellow inside, and spotted; peduncles solitary, one-flowered, sweet scented. *fr.* muricated, with fleshy points, green. *l.* ovate-lanceolate, smooth, shining. *h.* 15ft. West Indies, 1656.

A. palustris (marsh). Alligator Apple; Cork-wood. *fl.* yellow; petals all acute. *fr.* rather areolate, large, heart-shaped, sweet-scented. *l.* ovate-oblong, leathery, quite smooth. *h.* 10ft. to 20ft. South America, 1788.

A. reticulata (netted). The Custard Apple, or Bullock's Heart. *fl.* outer petals oblong-lanceolate, acute, somewhat concave at the base, brownish on the outside, whitish-yellow on the inside, marked with dark purple spots. *fr.* ovate-globose, reticulate, as large as a tennis ball, with yellowish soft flesh; it is much esteemed by some people. *l.* oblong-lanceolate, acute, smooth, somewhat dotted. *h.* 15ft. to 25ft. Brazil, 1690.

A. squamosa (scaly). Sweet Sop. *fl.*, outer petals linear-oblong, somewhat concave at the base, nearly closing, greenish-yellow. *fr.* egg-shaped, scaly. *l.* oblong, bluntish, smooth, full of pellucid dots, rather glaucous beneath. *h.* 20ft. South America, 1739.

ANONACEÆ. An order of trees or shrubs, mostly tropical, with axillary peduncles, lateral or opposite the leaves, and with alternate, simple, entire or hardly toothed leaves, without stipules. *Anona* is the typical genus.

ANONYMO. A synonym of **Saururus** (which *see*).

ANONYMOS BRACTEATA. *See* **Zornia tetraphylla.**

ANOPLANTHUS (in part). A synonym of **Phelipæa** (which *see*).

ANOPLOPHYTUM. *See* **Schlumbergeria** and **Tillandsia.**

ANOPTERUS (from *ano*, upwards, and *pteron*, a wing; in reference to the seeds, which are winged at the apex). ORD. *Saxifrageæ*. A very handsome greenhouse evergreen shrub, having a free branching habit, large dark shining green leaves, and long panicles of salver-shaped flowers. It would probably prove quite hardy in the south and west of England, and parts of Scotland, provided it had a slight winter protection. It grows well in sandy loam and peat. When grown in pots, it requires plenty of room and water. Half-ripened cuttings root freely under a bell glass in a cool house or frame in summer.

A. glandulosa (glandular).* *fl.* white, rose tinted, large; racemes erect, simple, terminal. April, May. *l.* alternate, rarely nearly opposite, ovate-oblong, attenuated at both ends, nearly sessile, leathery, toothed. *h.* 3ft. Van Diemen's Land, 1823.

ANSELLIA (named after Mr. Ansell, the botanical collector who accompanied the ill-fated Niger Expedition). ORD. *Orchideæ*. Strong growing, free flowering stove epiphytal orchids. Best grown in large pots, as they produce a quantity of roots. They require a compost of turfy peat, with moderate drainage. An ample supply of water during the growing season is needed; but care must be taken not to let any remain in the heart of the plants, as they are very likely to rot. During the season of rest, little or no water, but a damp atmosphere, are the chief requirements. Propagated by divisions of the bulbs just after flowering.

A. africana (African).* *fl.*, sepals and petals nearly 2in. long, greenish yellow, spotted with brownish red; lip small, yellow; spikes large, drooping, branched, each sometimes bearing nearly a hundred blooms. Stems 3ft. to 4ft. high, with light evergreen foliage. Fernando Po, 1844. Lasts two months in perfection.

A. a. gigantea (gigantic).* *fl.* on upright spikes from the top of the pseudo-bulbs, but smaller, of a light yellow tint, with very few narrow, transverse, brown bars, and a deep yellow lip, without warts of any kind on its middle lobe, and with more or less crenulated keels. Natal, 1847. The perfume is very peculiar. Very rare.

A. a. lutea (yellow). Not so strong a grower; producing clusters of light yellow flowers from the top of the pseudo-bulbs. Natal.

A. a. nilotica (Nile district).* As a garden plant this is much superior to the type. The habit is dwarfer, the colours of the flowers brighter and more distinctly defined. The sepals and petals, too, are more spreading. Eastern Africa.

ANSERINA. *See* **Potentilla anserina.**

ANTENNÆ. Two movable, articulated organs attached to the heads of insects and crustacea, commonly called "horns" or "feelers." They are variable in form and length. Antennæ seem to serve for touch, and, perhaps, for smell and hearing.

ANTENNARIA (from *antennæ*; in reference to the similarity which exists between the seed down of the plant and the antennæ, or feelers, of an insect). ORD. *Compositæ*. Hardy herbaceous perennials, distinguished by the dry, coloured, chaffy scales encircling each head of flowers, of which the stamens and pistils are on different plants.

FIG. 105. ANTENNARIA MARGARITACEA, showing Habit and Inflorescence.

These are charming little alpine plants, admirably adapted for rockwork, pots, edgings, or borders, in any light soil.

Antennaria—*continued.*

Propagated by divisions of the roots in spring, and seeds; the latter should be sown in spring in a cold frame. Grown chiefly for their leaves.

A. dioica (diœcious).* *fl.-heads* pink, in crowded corymbs, 3in. to 4in. high. June. *l.* radical ones spathulate, woolly chiefly beneath; upper ones lanceolate. Stems simple; shoots procumbent. Britain. The two or three varieties of this pretty species exceed the type in beauty. SYN. *Gnaphalium dioicum.*

A. d. hyperborea (northern). *l.* woolly on both surfaces.

A. d. minima (smallest).* A very small growing variety.

A. margaritacea (pearly).* *fl.-heads* white, corymbose. August. *l.* linear-lanceolate, acute, alternate, cottony, especially beneath. Stems branched above. *h.* 2ft. Naturalised in England and on the Continent. Said to have been introduced from America about the sixteenth century. The prettier but much rarer *A. triplinervis*, from Nepaul, comes close to this species. See Fig. 105.

A. tomentosa (downy).* *fl.-heads* corymbose. Summer. One of the dwarfest and best of silvery-leaved plants, either as an edging for small beds or for covering the higher portions of rockwork; it is much used in carpet bedding. It scarcely grows more than 1in. high, and forms a dense carpet in a short space of time. It should be grown separate from other plants. It is frequently known under the name of *A. candida.*

ANTERIOR. Placed in front, or outwards.

ANTHEMIS (from *anthemon*, a flower; referring to their general floriferous character). Chamomile. ORD. *Compositæ*. Receptacle convex, chaffy. Involucre hemispherical or nearly flat; scales imbricated, membranaceous at the margin. Pappus none; ray florets ligulate; disk tubular. This is a large genus, principally of medicinal value, and contains very few species worth the cultivator's trouble. Of easy culture in any ordinary soil. Propagated by divisions.

A. Aizoon (Aizoon).* *fl.-heads* resembling a white Daisy; florets of the ray fourteen to eighteen, trifid, twice as long as the breadth of the disk. Summer. *l.* lanceolate, or broadly so, acutely and deeply serrated, narrowed towards the base, covered with white down; lower ones crowded; stem-leaves rather acute, gradually lessening in size. *h.* 2in. to 4in. Northern Greece. Free grower, dwarf, and compact.

A. Biebersteinii (Bieberstein's).* *fl.-heads* yellow. Summer. *l.* pinnately divided into linear three-lobed segments, which are covered with white silky pubescence. *h.* 1ft. to 2ft. Caucasus.

A. nobilis (noble). Common Chamomile. *fl.-heads* solitary; disk yellow; ray white; scales of the receptacle membranous, scarcely longer than the disk. *l.* bipinnate; segments linear-subulate, a little downy. Stem procumbent, and much branched. England. For culture, *see* **Chamomile.**

A. tinctoria (dyer's). *fl.* bright yellow. July and August. *l.* bi-pinnatifid, serrate, downy beneath. Stem angular. *h.* 1½ft. England.

ANTHER. The male part of a flower containing the pollen.

ANTHERICLIS. A synonym of **Tipularia.**

ANTHERICUM (from *anthos*, a flower and *kerkos*, a hedge; in reference to the tall flower stems). SYN. *Phalangium.* ORD. *Liliaceæ*. A large genus, belonging to the capsular group of the order, and inhabiting, for the most part, the Cape of Good Hope. Flowers white, racemose or panicled, scapose; perianth segments either spreading from near the base or campanulately united; stamens short, with naked or bearded filaments. Leaves radical, filiform or linear. The hardy varieties are now extensively grown, and are among the most ornamental of border plants. They thrive best in rich light soil, and are excellent subjects for pot culture; for which purpose use a compost of fibrous loam, leaf mould, or well-decayed manure, and coarse sand. The pots should be about 12in. across, well drained, and the plants potted just previous to, or so soon as, growth commences. During activity, plenty of water is needed, until the plants have finished flowering, when the quantity may be lessened; but never allow them to get dry. Propagated by division of the roots or seeds, sowing the latter, as early as possible after they are ripe, in a cold frame.

A. graminifolium (grass-leaved). A garden name of *A. ramosum.*

A. Hookeri (Hooker's). *See* **Chrysobactron Hookeri.**

A. Liliago (Liliago).* St. Bernard's Lily. *fl.* pure white, 1in. to 1½in. across; perianth segments spreading; style curved. May

Anthericum—*continued.*

to August. *l.* tufted, narrow, channelled, 12in. to 18in. high. South Europe, 1596. A very free flowering species, of which there is a *major* variety in gardens. SYNS. *Phalangium* and *Watsonia Liliago.*

A. Liliastrum (Liliaster).* St. Bruno's Lily. *fl.* much larger than the last, 2in. long, and as much across, fragrant, of a trans-

FIG. 106. ANTHERICUM LILIASTRUM, showing Habit and Flower.

parent whiteness, with a delicate green spot on the point of each segment, campanulate, arranged in loose spikes. Early summer. *l.* long, narrow, six or eight to each plant, about 1ft. to 2ft. long, *h.* 1ft. to 2ft. South Europe, 1629. SYNS. *Czackia Liliastrum* and *Paradisia Liliastrum* (this is the correct name). See Fig. 106.

A. L. major (greater). *fl.* about 1in. larger than the type. *h.* about 6ft. A very desirable border plant.

A. ramosum (branched).* *fl.* white, rather smaller than those of *A. Liliago;* perianth segments narrow and spreading; style straight; flower stems much branched. June. *l.* long, narrow, channelled, grass-like. *h.* 2ft. South Europe, 1570. A rapid grower. SYN. *A. graminifolium* (of gardens).

A. serotinum (late-flowering). *See* **Lloydia.**

A. variegatum (variegated). *l.* keeled, grass-like, striped and margined with white. South Africa, 1875. Half hardy. The proper name of this plant is *Chlorophytum elatum variegatum.* SYNS. *A. Williamsii* and *Phalangium argenteo-lineare.*

A. Williamsii (Williams'). Synonymous with *A. variegatum.*

ANTHERIDIA. The reproductive organs in cryptogamic plants, analogous to anthers in flowering plants.

ANTHERIFEROUS. Bearing anthers.

ANTHESIS. The opening period of flowers.

ANTHOCARPOUS. Bearing a fruit resulting from many flowers.

ANTHOCERCIS (from *anthos*, a flower, and *kerkis*, a ray; in reference to the radiated corolla). ORD. *Solanaceæ.* Handsome greenhouse evergreen shrubs, with alternate leaves, attenuated into the petioles or base, thick, sometimes glandularly dotted. Flowers axillary, generally solitary; corolla campanulate. Cuttings strike freely in sand under a bell glass, with a mild bottom heat. So soon as they have well rooted, pot off into very small pots in two-thirds good loam and one of peat. After having made a little headway, the leading shoots should be pinched off, to induce a lateral growth; they may be transferred to pots a size larger when the roots have filled the first pot. Continue growing throughout the summer in frames or in the greenhouse, near the glass, allowing plenty of air. Vigorous growth should be checked; thus encouraging bushy plants.

A. albicans (whitish-leaved).* *fl.* white, streaked with bluish-purple inside the tube, fragrant; petals longer than the tube. April. *l.* oblong, obtuse, densely tomentose on both surfaces, as well as the branches. *h.* 1½ft. to 2ft. New South Wales, 1824.

Anthocercis—*continued.*

A. floribunda (many-flowered). *fl.* white. *h.* 3ft. New South Wales.

A. ilicifolia (Holly-leaved). *fl.* yellowish green. June. *h.* 6ft. Swan River, 1843.

A. littorea (shore). *fl.* white. June. *h.* 3ft. New Holland, 1803.

A. viscosa (clammy).* *fl.* large, white. May. *l.* obovate, glandularly dotted with scabrous margins; young leaves and branches clothed with fine down. *h.* 4ft. to 6ft. New Holland, 1822.

ANTHODON. Included under **Salacia.**

ANTHOLOMA (from *anthos*, a flower, and *loma*, a fringe; in allusion to the fringed or crenulated limb of the corolla). ORD. *Tiliaceæ.* A fine greenhouse evergreen tree, thriving in a mixture of light loam and peat. Cuttings of ripened wood root in sand, under a hand glass.

A. montana (mountain).* *fl.* white; corolla ovately cylindrical, with a crenate, rather toothed margin; racemes axillary, somewhat umbellate, reflexed. May. *l.* elliptical-oblong, leathery, stalked, scattered at the top of the branchlets. *h.* 20ft. New Caledonia, 1810.

ANTHOLYZA (from *anthos*, a flower, and *lyssa*, rage; in reference to the opening of the flowers, which resemble the mouth of an enraged animal). SYN. *Petamenes.* Including *Anisanthus.* ORD. *Irideæ.* A very pretty genus of bulbous plants from the Cape of Good Hope, having narrow, erect, Iris-like leaves, and flower-spikes that overtop the foliage, bearing numerous bright-coloured flowers. Perianth tubular, six-cleft, unequal, the upper segments longest; stamens three. The species may be grown in a greenhouse, or planted out in a frame. They also thrive excellently out of doors, and should be planted 8in. or 9in. deep for fear of frost, or have a winter protection of several inches of cocoa-nut fibre refuse or litter. The safer plan is to raise the roots, winter them in some dry part of the greenhouse; but, previous to storing, divide the clumps, clean them, and re-plant or pot in February, or early in March. A mixture of equal parts peat, sandy loam, and leaf soil is most suitable for their culture. Just previous to flowering, if in pots, frequent doses of weak manure water will be found beneficial. They may be propagated by offsets, which are produced in abundance, at almost any time. Seeds are sometimes procured, which should be sown so soon as ripe, in light soil, in a cool house, where they will germinate the following spring, and will be fit to plant out in the summer of the same year. With the exception of *A. Cunonia*, they all much resemble each other. Only four or five species of this genus are worth cultivating.

A. æthiopica (Æthiopian).* *fl.* scarlet and green. June. *h.* 3ft. 1759. SYNS. *A. floribunda, A. prœalta.*

A. æ. ringens (gaping). *fl.* red and yellow, rather smaller than those of the type. SYN. *A. vittigera.*

A. bicolor (two-coloured). Synonymous with *A. Cunonia.*

A. caffra (Caffrarian).* *fl.* rich scarlet; spike distichous, many-flowered. June. *l.* long, linear, or linear-ensiform. *h.* 2ft. 1828. A very showy and pretty species, but rarely seen in our gardens. SYN. *Anisanthus splendens.*

A. Cunonia (Cunon's).* *fl.* scarlet and black, a combination of colours uncommon among bulbous plants; spikes secund. June. *h.* 2ft. 1756. SYN. *Anisanthus Cunonia.*

A. floribunda (much-flowered). A synonym of *A. æthiopica.*

A. prœalta (very tall). Synonymous with *A. æthiopica.*

A. vittigera (glandular). Synonymous with *A. æ. ringens.*

ANTHOMYIA. *See* **Beet Fly, Cabbage Fly,** and **Onion Fly.**

ANTHONOMUS. *See* **Grubs.**

ANTHOSPERMUM (from *anthos*, a flower, and *sperma*, a seed). Amber Tree. ORD. *Rubiaceæ.* An ornamental greenhouse evergreen shrub from the Cape of Good Hope. It thrives in peat, loam, and sand, with a summer temperature of 50deg. to 65deg., and winter, 40deg. to 45deg. Increased by cuttings, in sand, under a bell glass. There are above twenty other species belonging to this genus.

A. æthiopicum (Æthiopian).* *fl.* dicœious, male brownish, and the female ones green, disposed in verticillate spikes. June. *l.* linear-lanceolate, three in a whorl, shining above, glabrous beneath, about ¼in. long. Stem much branched, downy above. *h.* 2ft. to 3ft. 1692.

ANTHOTAXIS. The arrangement of flowers on an inflorescence.

ANTHOXANTHUM (from *anthos*, a flower, and *xanthus*, yellow). Spring Grass. Calyx of two valves, glumaceous, one-flowered; corolla double, each of two valves: the exterior awned; the interior small, awnless; stamens two, not three, as is usually the case with grasses. ORD. *Gramineæ*. A pretty native hardy perennial, of easy culture in common garden soil.

FIG. 107. ANTHOXANTHUM ODORATUM.

A. odoratum (sweet). Vernal Grass. *fl.*, panicle spiked, oblong, dense, becoming dullish yellow. *l.* short, pale green. *h.* 1ft. The pleasant smell of new-made Hay is chiefly owing to this plant, which in drying emits an odour similar to that of *Asperula odorata*. See Fig. 107.

ANTHURIUM (from *anthos*, a flower, and *oura*, a tail). Tail Flower. ORD. *Aroideæ* (*Araceæ*). Flowers densely disposed on a cylindrical spadix, at the base of which is a large bract-like spathe, that ultimately bends backwards. Leaves of various shapes. This very large genus of handsome stove and greenhouse plants is remarkable both for the peculiar inflorescence and often noble leaves, and is distinguished in structure from all the European members of the order in the flowers being hermaphrodite. Fibry peat, loam, sphagnum, broken crocks, or charcoal, and silver sand, form the most suitable compost. In preparing the peat, it should be broken up into small lumps, and then have most of the earthy matter knocked out of it by giving it a few raps with a stick, or by shaking it about in a sieve. To this, after so treated, add about one-fourth its bulk of sphagnum, and about half its bulk of fibrous loam, and just a sprinkling of fresh broken crocks, or small pieces of charcoal and sharp silver sand. In placing them in the pots—which must be well drained—carefully spread out the roots and work the mixture among them, keeping the plant well up, so that when finished it stands

Anthurium—*continued.*

clear above the rim of the pot at least 2in. or 3in., and forms a kind of mound or hillock. They must then be kept freely syringed or watered, and placed in a moist atmosphere, where they can enjoy a temperature ranging between 60deg. and 70deg., or a few degrees lower for the less tender species. Raising plants from seed requires patience. About a year elapses from the time the flowers are fertilised—which should be done artificially—before the seed ripens, and often another to get up plants. Sow as soon as ripe in shallow, well-drained pans or pots, filled with the potting mixture, and cover slightly, and place in a close, moist propagating case, where a temperature of from 75deg. to 85deg. is maintained, or they may be covered with bell glasses. The principal thing is to keep the air about them constantly humid, and the material in which they are sown in a uniformly moist condition; if this is done, the young seedlings will make their appearance in due course. When these are of sufficient size to handle, they should be pricked off in the same sort of compost, and be kept close and moist till they get a start, after which gradually inure them to more air. January is the best month of the year wherein to propagate these plants by divisions. This is done by carefully turning them out of their pots and shaking out what soil they have amongst their roots, which must be tenderly dealt with, so as not to bruise or injure them. This done, they may then be pulled apart, and as many plants made as there are separate crowns, or the mass may be simply halved or quartered, according to the stock required. Treat now as recommended above for potting. They are all moisture-loving plants, and must have a copious supply of water at all times, although, of course, much less during the winter than spring and summer months. There is no season of the year when they can be handled for any purpose with less risk or check than January. A moderate moist stove heat is advisable for them generally. The species enumerated are selected from nearly 150, and will be found to be a very representative collection. *See also* **Spathiphyllum.**

A. acaule (stemless).* *fl.*, spadix blue in a young state, borne on long footstalks, sweetly scented. Spring. *l.* broad, oblong, acuminate, 1ft. to 3ft. in length, erect, arranged in a rosulate manner, dark shining green on the upper surface, somewhat paler beneath. West Indies, 1853. A noble species.

FIG. 108. ANTHURIUM ANDREANUM.

A. Andreanum (André's).* *fl.*, spadix about 3in. long, yellowish, with a broad central band of white; spathe open, cordate-ovate, orange red, leathery, 3in. to 4in. across, and 6in. to 9in. long; surface irregularly corrugated. *l.* ovate-lanceolate, deeply cordate, green. Columbia, 1876. A very beautiful species. See Fig. 108.

A. Bakeri (Baker's).* *fl.*, spathe small, green, reflexed; the spadix, wherein lies the plant's principal beauty, exhibits a lovely

Anthurium—*continued.*

combination of pink and bright scarlet; the fleshy rachis being pink, and the pea-sized fruits bright scarlet. July. *l.* linear, leathery, green, with stout midribs. Costa Rica, 1872.

A. cordifolium (cordate-leaved).* *l.* 3ft. long and 20in. broad, heart-shaped, deep shining green on the upper surface, and paler below. *h.* 4ft. New Grenada. One of the best, and may be grown in a greenhouse or even in a sheltered spot of the sub-tropical garden during July and August. *A. Browni*, although quite distinct, comes close to this species.

A. coriaceum (leathery).* *l.* very thick, leathery, ovate, about 2ft. long; petioles stout, about the same length. Brazil. An admirable sub-tropical species.

FIG. 109. ANTHURIUM CRYSTALLINUM.

A. crystallinum (crystalline).* *l.* large, ovate-cordate, acuminate, bright rich velvety green, principal veins elegantly banded with pure crystal white; when young, the leaves are violet colour; petioles terete. *h.* 2ft. Columbia. See Fig. 109.

A. cuspidatum (cuspidate). *fl.*, spathe crimson, reflexed, shorter than the purplish spadix. *l.* ovate-oblong, acuminate, 10in. to 20in. long, green. *h.* 2ft. to 3ft. Columbia.

A. ferrierense (Ferrières).* *fl.*, spathe cordate, about 5in. long, and 4in. wide, bright red; spadix erect, about 4in. long, ivory white. *l.* large, cordate. A handsome hybrid between *A. ornatum* and *A. Andreanum.*

A. fissum (cut-leaved). *fl.*, spathe green, erect, narrowly lanceolate-acuminate. *l.* cut into four to seven elliptic oblong-acuminate segments, green; petioles longish, terete. *h.* 2ft. Columbia, 1868.

A. Harrisii pulchrum (beautiful).* *fl.*, spathe linear-lanceolate, creamy white, deflexed, and pinkish at top; spadix erect, deep crimson; scape about 1ft. long, pale green. *l.* lanceolate, rounded at the base, pale green, with confluent white markings intermixed with dark green. Stem short. Brazil, 1882. A beautiful variegated plant. The typical *A. Harrisii* is extremely rare.

A. Hookeri (Hooker's). *fl.*, spathe green; spadix green or violet; *l.* obovate-spathulate, narrowed to a wedge-shaped base, and shortly stalked, shining, about 30in. long and 8in. broad. *h.* 3ft. Tropical America, 1840. SYNS. *A. Huegelii, Pothos acaulis.*

A. Huegelii (Huegel's). A synonym of *A. Hookeri.*

A. insigne (showy).* *l.* three-lobed, middle lobe lanceolate, the two lateral ones are nearly ovate, and have from three to five longitudinal ribs; when young, the leaves have a bronzy tinge; petioles terete, slightly sheathing at the base. Columbia, 1881. A very handsome species.

A. Kalbreyeri (Kalbreyer's).* *l.* palmate, about 2½ft. across; leaflets nine, obovate-oblong, acuminate, sinuate, thick, glabrous, rich deep green, those furthest from the stem are much larger than those next the axis; petiole cylindrical, thickened at the top. New Grenada, 1881. A very handsome climbing species.

A. lanceolatum (lanceolate). *fl.*, spathe lanceolate, deflexed, yellowish green; spadix dark brown. *l.* lanceolate, stalked, green, 1ft. long, narrowed to the base. There appears to be much confusion as regards this and many varieties of *A. Harrisii*; and the specific designation is indiscriminately applied to lanceolate-leaved forms generally. The true species was introduced to Kew from the West Indies. SYN. *A. Wildenowii.*

A. leuconeurum (white-nerved). Green. Mexico, 1862.

A. Lindenianum (Linden's).* *fl.* fragrant, spathe very pretty, white, not reflexed, but the pointed apex slightly arches over and shelters the white or purplish spadix. October. *l.* deeply cordate, of a roundish outline; petioles long. *h.* 3ft. Columbia, 1866. SYN. *A. Lindigi* (of gardens).

A. Lindigi (Lindig's). A garden synonym of *A. Lindenianum.*

Anthurium—*continued.*

A. macrolobum (large-lobed).* *l.* large, deflexed, cordate, acuminate, with an open sinus at the base, and about three acute marginal lobes, dark green, marked with about five pale green ribs; petioles green, terete. Stem erect, short. A fine hybrid.

A. nymphæifolium (Nymphæa-leaved). *fl.*, spathe white; spadix purplish. Venezuela, 1854.

A. ornatum (adorned).* *fl.*, spathe linear-oblong, white, 5in. to 6in. long, on terete green scapes, enclosing cylindrical purplish spadices of about the same length as the spathes, and studded with white points arranged spirally. Spring. *l.* ovate or oblong-cordate, on slender terete petioles. *h.* 2½ft. Venezuela, 1869.

A. regale (royal).* *l.* large, cordate-acuminate, 1ft. to 3ft. long, dull metallic green, with white veins; young leaves tinged with rose, on long smooth footstalks. East Peru, 1866. An excellent species for conservatory or window decoration during summer.

FIG. 110. ANTHURIUM SCHERZERIANUM.

A. Scherzerianum (Scherzer's).* *fl.* on bright red peduncles, which spring from among the base of the leafstalks; spathe ovate-oblong, 3in. long and nearly 2in. broad, intense and brilliant scarlet; spadix orange coloured. *l.* oblong-lanceolate, 12in. to 18in. long, and 2in. or more broad, deep rich green, leathery. Costa Rica. A very compact dwarf-growing evergreen about 1ft. high. It continues in beauty about four months. See Fig. 110.

A. S. album (white). A synonym of *A. Scherzerianum Williamsii.*

FIG. 111. ANTHURIUM SCHERZERIANUM MAXIMUM.

Anthurium—*continued.*

A. S. maximum (greater).* A very fine variety, with "gigantic flower spathes, which measure about 9in. in length by 4in. in breadth, and are of the most brilliant scarlet colour." See Fig. 111.

A. S. pygmæum (small).* Altogether smaller than the type, with narrow leaves, which are from 4in. to 6in. long, and about ½in. broad. It is one of the best varieties, and produces flowers very freely. 1880.

A. S. Rothschildianum (Rothschild's). *fl.*, spathe creamy white, spotted with crimson; spadix yellow. 1880. Exactly intermediate between its parent plants—the typical species and the following variety.

A. S. Wardii (Ward's).* *fl.*, spathe 6in. long, 4in. broad, very brilliant. *l.* broader and more robust than those of the typical species. A splendid variety.

A. S. Williamsii (Williams's).* *fl.*, spathe white; spadix yellowish. May. *l.* lanceolate-acuminate. Costa Rica, 1874. SYN. *A. Scherzerianum album.*

A. signatum (well-marked). *l.* apparently three-lobed; front lobe about 1ft. long and 4in. wide; the two side ones 4in. long, and about 6in. from the midrib to the extremity, dark green; petioles about 1ft. long. Venezuela, 1858.

A. spathiphyllum (Spathiphyllum). *fl.*, spathe about 1¾in. long, and nearly as much broad, erect, boat-shaped, broadly ovate, white; spadix nearly 1in. long, very obtuse, pale yellow. *l.* narrow lanceolate, 16in. to 24in. long, and about 2in. wide, bright green above, pale greyish green beneath; midrib prominent; petiole 3in to 6in. long, trigonous. *h.* 1½ft. Tropical America, 1875.

A. splendidum (splendid).* *l.* cordate, with an open sinus, the lobes meeting behind; "the course of the nerves is marked by a broadish band of deep lustrous velvety green, the intervening spaces of about equal width being in striking contrast, of a pale yellowish green; the leaf surface is scabrous, and the portions between the ribs strongly bullate, as if raised in papillose blisters; the veins on the under surface are angular, with tooth-like projections at intervals, while the whole under surface is punctuate with small pallid dots" (W. Bull). Stem short, thick. South America, 1882. A very beautiful species, quite distinct from any others of the genus. See Fig. 112.

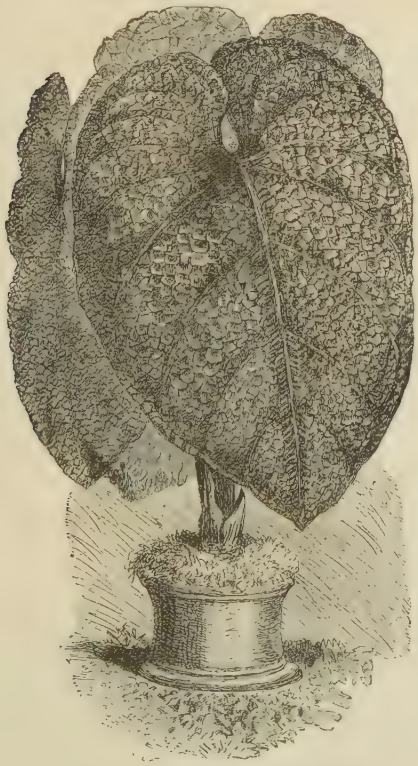


FIG. 112. ANTHURIUM SPLENDIDUM.

A. subsignatum (nearly allied to Signatum).* *l.* thick and fleshy, hastate, with blunt points, 12in. to 18in. long, and as much in breadth at the widest part; dark shining green above, paler beneath; petioles about 1ft. long. *h.* 1½ft. Costa Rica, 1861. An excellent species.

Anthurium—*continued.*

A. tetragonum (four-angled). *l.* erect, commences very narrow, 1ft. wide at its broadest part; margins undulate, deep shining green on the upper surface, paler below; petioles short, quadrangular. Tropical America, 1860. An excellent sub-tropical species.

A. triumphans (superior). *fl.*, spathe narrow, green; spadix stout, greenish-white; peduncle quadrangular. *l.* alternate, elongately cordate, bright green; ribs prominent, and of a paler hue. Stem erect. Brazil, 1882. A handsome plant.

A. Veitchii (Veitch's).* *l.* ovate-oblong, greatly elongated, 2ft. to 3ft. long, with a breadth of less than than one-third of these dimensions, leathery, deep green, with a glossy metallic surface when first expanded that becomes paler with age; the principal nerves are arched and deeply sunk, imparting a curiously waved appearance to the surface. *h.* 2½ft. Columbia, 1877. Rare but very handsome.

A. Waluiewi (Walujew's).* *l.* broadly cordate, 12in. to 14in. long, 8in. to 10in. broad, olive metallic green, when young, bright reddish crimson; petioles four to five-angled. *h.* 2ft. Venezuela, 1880. A very distinct and noble species.

A. Waroqueanum (Waroque's).* *l.* elongated, from 24in. to sometimes 36in. long, and 8in. to 11in. broad, very rich deep green, of a velvety lustre; midribs and veins light, forming a very pleasing contrast. Columbia, 1878. A very free grower.

A. Wildenowii (Wildenow's). A synonym of *A. lanceolatum.*

It may be here remarked that by far the majority of species enumerated in the *Supplement* of Johnson's Dictionary are chiefly of botanical interest, and will, therefore, never become extensively cultivated.

ANTHYLLIS (from *anthos*, a flower, and *ioulos*, down; flowers usually downy). Kidney Vetch. ORD. *Leguminosæ.* Herbaceous or sub-shrubby plants, of variable habit. Flowers in spikes or heads; calyx tubular, five toothed, permanent after flowering, more or less inflated. Petals nearly equal. Although not extensively grown, all the species are very beautiful when in flower, the hardy sorts being admirably adapted for rockwork. The herbaceous perennials may be easily propagated by seed or division. The seeds of the annual kinds should be sown in a rather dry, warm situation in the open ground. The shrubby evergreens will need the protection of a frame or cool greenhouse in cold northern climates, and are best grown in a mixture of loam, sand, and peat. Young cuttings of most species will root in a pot of sandy soil, with a bell glass placed over them, in a cool house or frame.

A. Barba-Jovis (Jupiter's beard).* *fl.* pale yellow, numerous, in globose, bracteate heads. March. *l.* pinnate, and are as well as the branches, clothed with silky tomentum; leaflets nine to thirteen, oblong-linear. *h.* 4ft. to 8ft. Spain, 1640. Shrub.

A. erinacea (prickly).* *fl.* bluish-purple; heads few flowered, on short peduncles, bracteate. April. *l.* very few, oval, or oblong. *h.* 6in. to 12in. Spain, 1759. A much branched, spiny, almost leafless, and slow-growing species; hardy in a dry sunny position on the rockery. SYN. *Erinacea hispanica.*

A. Hermanniæ (Hermann's). *fl.* yellow; heads few flowered, nearly sessile in the axils of the upper leaves. April. *l.* almost sessile, simple, or trifoliate; leaflets oblong-cuneated, glabrous or clothed with adpressed pubescence. *h.* 2ft. to 4ft. Corsica, 1739. Shrubby, much branched.

A. montana (mountain).* *fl.* pink or purplish, in dense heads, on peduncles, with a leafy involucre. June. *l.* pinnate, and are as well as the branches, silky and hoary; leaflets numerous, oval-oblong, acute, small, entire. *h.* 3in. to 6in. Alps of Europe, 1759. A very handsome little rock plant, with a dwarf and tufted habit.

A. tetraphylla (four-leaved). *fl.* white; heads axillary, sessile, few flowered. July. *l.* pinnate, the terminal leaflets ovate and large, the other three small and acute. South Europe, 1640. A procumbent annual.

A. Vulneraria (Common Woundwort).* *fl.* generally yellow, sometimes white, red, or pinkish, in crowded twin heads. Summer. *l.* pinnate, with five or more unequal leaflets; the lower ones smallest. An elegant native herbaceous, perennial, admirably adapted for rockwork. It is plentiful in most dry pastures. There are several varieties, the best of which is *alba.*

ANTIARIS TOXICARIA. This is the famous Upas tree of Java, from which is obtained poison of a most deadly nature. It belongs to the NAT. ORD. *Urticaceæ.*

ANTICLEA. Included under **Zygadenus.**

ANTIGONON (from *anti*, against or opposite, and *gonia*, an angle). ORD. *Polygonaceæ.* Elegant stove climbers. Flowers racemose, cirrhose at the apex of the rachides; petals five, three outer ones broadly cordate, two inner oblong. Leaves alternate, cordate. Although extremely

Antigonon—*continued.*

handsome plants, they are difficult to flower. They seem to succeed best when planted out in a very thoroughly drained border over hot-water pipes or flues, the long climbing stems being trained near the glass in full light.

A. amabile (lovely).* *fl.* bright rose, profusely borne in axillary and terminal racemes. *l.* 3in. to 5in. long, ovate-cordate, and deeply lobed at the base. It is of free slender growth, the young shoots are pubescent, and having a slight reddish tinge. An exceedingly attractive and effective species.

A. guatemalensis (Guatemala). Probably the same as *A. insigne.*

A. insigne (remarkable).* *fl.* very numerous, borne in tufts along the sides of long racemes or panicles, which terminate in branched tendrils; the calyx, which is the showy part of the flower, has five membranous sepals, the three outer are of a beautiful rosy pink colour, about 1in. in length by rather less in breadth, cordate at the base, oblong, rounded towards the apex; the two inner sepals about the same length as the outer ones, but much narrower, falcate, lanceolate; pedicels ¾in. long. *l.* broadly ovate oblong, deeply cordate at the base, with two rounded lobes; 4in. by 3in., the upper ones smaller, supported on short terete downy stalks. Stems slender, angular, pubescent. Columbia, 1876.

A. leptopus (slender-stemmed). *fl.* numerous; the outer three sepals of a beautiful rose colour, the centre of a much deeper tint; racemes secund, bearing several coloured bracts as well as flowers, and end in a branched tendril. *l.* alternate, cordate, petiolate. Stem slender, sub-pubescent. Mexico, 1868.

ANTIGRAMME. *See* **Scolopendrium.**

ANTIRRHINUM (from *anti*, like, and *rhin*, a nose or snout; alluding to the shape of the corolla). Snapdragon. ORD. *Scrophularineæ.* Hardy herbaceous plants. Flowers in terminal racemes, or solitary and axillary; corolla personate; tube ample, saccate at the base; lobes of the upper lip erect; lower lip spreading, having the middle lobes smaller than the lateral ones, with an ample bearded palate, which closes the throat. Seed pod or capsule two-

FIG. 113. ANTIRRHINUM CAPSULE, with Persistent Style.

celled, upper cell bursting by one pore, lower by two many-toothed pores. See Fig. 113. Leaves entire, rarely lobed. The genus contains several very handsome species, suitable for borders and the rockery, while innumerable varieties have originated from *A. majus*, which are very popular, and extremely useful for bedding purposes; these may be

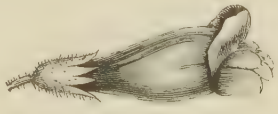


FIG. 114. ANTIRRHINUM ASARINA, showing Habit and Flower.

increased by cuttings or seeds; if it is desired to increase certain colours or varieties, the former is the only sure method to adopt. They should be taken in September,

Antirrhinum—*continued.*

when they will readily root in a cold frame, or under a hand glass, or they may be rapidly propagated in gentle heat in spring. Seeds should be sown in July or August, when they will produce good plants by the following season; or if sown in March in warmth, the plants will bloom late in the same year. The "Tom Thumb" strain is especially desirable for bedding, being very dwarf and free. All the other species may be increased by cuttings and seeds treated in the same way. Light soil, well enriched with manure, is most suitable for all of them, especially for the varieties of *A. majus.*

FIG. 115. RACEME OF ANTIRRHINUM MAJUS.

A. angustifolium (narrow-leaved). Synonymous with *A. siculum.*

A. Asarina (Asarina).* *fl.* axillary, solitary; corolla 1½in. long, white, sometimes tinged with red; palate yellow; tube glabrous, compressed on the back, marked by purple spots, and bearded by yellow hairs inside. June. *l.* opposite, on long petioles, five-nerved, five-lobed, cordate, and crenated. South France, &c., 1699. A greyish clammy procumbent plant, requiring a warm position on the rockery. See Fig. 114.

A. hispanicum (Spanish). *fl.* in loose spikes; corolla hardly an inch long, purple, with a golden yellow palate; tube villous. Summer. *l.* oblong-lanceolate, contracted at the base, bluntish; lower ones opposite; superior ones alternate, narrower. *h.* 1ft. Spain, 1878. SYN. *A. latifolium.*

A. latifolium (broad-leaved). Synonymous with *A. hispanicum.*

Antirrhinum—*continued.*

A. majus (large).* Greater, or Common Snapdragon. *fl.* racemose, approximate; corolla 1in. to 2in. long, shades infinite; palate yellow at top, very prominent; tube downy outside. Spring, summer, and autumn. *l.* oblong-lanceolate, 1in. to 3in. long; upper ones narrower, attenuated at both ends, glabrous. Branches erect, usually branched again. *h.* 2ft. Europe (naturalised in Britain). The named varieties are numerous, but it is unnecessary to enumerate any, as an equal amount of variation can be obtained from seed. See Fig. 115.

A. molle (soft).* *fl.* few, at the tops of the branchlets; corolla 1in. long, whitish, with a yellow palate; upper lip striped with purple. July. *l.* opposite, petiolate, clothed with glandular and clammy hairs, about ¼in. long, and little more than ⅛in. broad; branches procumbent, slender, clothed with woolly hairs. Pyrenees, 1752. A very pretty plant, which should have a warm position on the rockery. *A. sempervirens* comes close to this species.

FIG. 116. ANTIRRHINUM ORONTIUM.

A. Orontium (Orontium). *fl.* axillary, distant; corolla rose-coloured or white, striped with purple; tube furnished with a few glandular hairs; palate veined with purple; sepals linear-lanceolate, large. June. *l.* oblong-lanceolate, acutish, attenuated at both ends, glabrous, 2in. long. *h.* 6in. to 12in. Europe (British cornfields). Annual. See Fig. 116.

A. O. grandiflorum (large-flowered). A variety with larger, paler, and more approximate flowers, and with broader leaves, than the type. Europe (British cornfields).

A. siculum (Sicilian). *fl.* in loose racemes; corolla hardly 1in. long, white or yellowish, rarely purple; tube rather hairy; lobes of the upper lip and the middle lobe of the lower lip emarginate. July. *l.* 1in. to 1½in. long, linear-lanceolate, opposite, alternate or three in a whorl, narrowed into petioles at the base. Branches erect. *h.* 1ft. to 2ft. Sicily, 1804. SYN. *A. angustifolium.*

A. tortuosum (twisted).* *fl.* disposed in spiked racemes, approximating by threes and fours; corolla (the largest of the genus) purple; tube short; upper lip large. June. *l.* linear, acute, opposite or three in a whorl, 2in. long, attenuated at both ends; upper ones very narrow. Branches erect. *h.* 1ft. to 1½ft. Italy.

ANTONIA. A synonym of **Rhynchoglossum** (which *see*).

ANTROPHYUM (from *antron*, a cavern, and *phuo*, to grow; referring to its place of growth). Including *Polytœnium.* ORD. *Filices.* A small genus of stove ferns, very rarely seen in cultivation, all with simple fronds, of firm but fleshy texture, and copious, uniform, hexagonal areolæ. Sori carried along the veins, imperfectly reticulated. For culture, &c., *see* **Ferns.**

A. cayennense (Cayenne). *sti.* 1in. to 4in. long. *fronds* 6in. to 9in. long, 1in. to 1½in. broad, lanceolate-oblong, narrowed at both ends; edge thickened, entire; areolæ half as broad as long. *sori* sub-superficial, often forked. Guiana, &c.

A. coriaceum (leathery). *fronds* 6in. to 8in. long, about ½in. broad, narrowed very gradually from the centre to the base, very acute at the apex, very thick; areolæ very long and narrow, distinctly raised on the upper surface. *sori* quite immersed, sometimes confluent. Himalayas, &c.

A. lanceolatum (lance-leaved).* *fronds* 1ft. or more long, ½in. to ¾in. broad, point acute, edge entire, the lower half narrowed very gradually to the base; areolæ two or three times as long as broad, about three rows between the midrib and the edge. *sori* slender, superficial, often joining. West Indies, southwards to New Grenada, 1793.

ANTS (*Formicidæ*). Well-known pests, easily distinguished from all other insects. There are a great number of species, differing more or less in habits; but, as a rule, they dwell underground in communities, and construct extensive ant-cities, which are occupied by three classes — the neuters or workers (by far the most numerous), the males, and the females. There are often, in addition to these, larger and stronger neuters, known as the "soldiers," or defenders of the community. Ants have a long, slender body, supported on long and slender legs. The head bears a pair of elbowed horns or antennæ, constantly waving about and touching everything the insect comes across. They have powerful mandibles

Ants—*continued.*

for cutting, sawing, and biting, and it is with these instruments that Ants do mischief in gardens. The winged males and females become mature in summer, and on a warm day they ascend in a body into the air; after a short time, they fall to the ground, the females at once free themselves from the henceforth useless wings, and begin to form new colonies. Vast numbers of eggs are laid, from which issue larvæ, and these soon become pupæ, and then perfect Ants. Some kinds are injurious from their habit (in some species) of collecting aphides together, and farming them for the sake of the honey secreted by the aphides, and that passes out from their honey-tubes (thus helping to perpetuate the stock of these most injurious insects); and also from the mechanical damage they do in pots, and other receptacles for plants. They likewise cause unsightly hills on lawns and paths, and the large black species that live in decayed wood often injure the framing of greenhouses, &c., when the woodwork has become somewhat decayed. Where fruit, such as peaches or wall pears, are grown, Ants will at times inflict damage, and, therefore, they should be kept away; but this is a comparatively easy matter, as the placing of an obnoxious substance along the base of the walls and around the stems of the trees will deter them. For the extirpation of Ants from indoors, the Arsenical solution described below is most efficacious, but it is extremely dangerous.

Lime. Air-slaked lime plentifully dusted, in warm, dry, weather, over and around the hills and other places infested, will cause the Ants to vacate them in a short time. A thick chalk line drawn round a smooth tree, or across an upright board or post, will render it impassable.

Arsenic. This must be used with the utmost caution, as it is a poison most fatal to animal life. Recipe: 1oz. of ordinary arsenic is placed in an old iron pot with a quart of water, and then boiled until reduced to a pint or a little more of liquid, to which is added ½lb. of coarse sugar. This mixture can either be dropped about the runs and around the nests, or placed in saucers in the Ants' haunts.

Ferrocyanide of Potassium. This is also very dangerous: Ferrocyanide of potassium, 1dr.; raspings of quassia, 1dr.; and enough sugar to form a syrup. Use in the same way as the preceding.

Calomel and Sugar. Mix together one part of calomel and ten parts of finely-powdered loaf sugar, and lay it in little heaps about their nests and runs; the Ants will eat it and die. Spring is the best season for this method.

Guano, when fresh, if sprinkled on and around their quarters, is said to be efficacious in driving them away.

Camphor. If a piece of camphor, about the size of a filbert, be placed in two quarts of hot water, and this, when cool enough, applied to pot or other plants infested with Ants, the insects will be driven off without injury to the plants.

Bones. Lay a quantity of partially-picked boiled bones in the haunts, and they will be quickly covered with insects. As soon as this occurs, throw the bones into hot water. Before laying them down again, let all superfluous moisture drain off. This is a cheap remedy, and, if persisted in, is very effectual.

Carbolic Acid. This, if of good strength, diluted with about ten or twelve times its bulk of water, and well sprinkled over paths or other places where there is no vegetation, will keep the Ants away. It has, however, an objectionable smell.

Paraffin Oil. Paraffin, mixed with six times its bulk of water, and sprinkled over the nests every few days, will kill and drive away Ants; but the smell is disagreeable.

Quassia. 4oz. of quassia chips, boiled in a gallon of water for about ten minutes, and 4oz. of soap added to the liquor as it cools, if used like the preceding, is fairly effectual; but this, like the other remedies, must be persisted in for some time.

Ants—*continued.*

Fly pans or saucers, nearly filled with thin honey or sweet oil, attract Ants, and they are drowned in them. Ants are very hard to clear effectually out of a place, and therefore it is very desirable, in all attempts to be rid of them, to persist in the above remedies. When not living close to the roots or stems of plants, the best and surest remedy of all is to flood them out or scald them in with boiling water. The specifics are endless, but the best are mentioned above.

ANTWERP HOLLYHOCK. *See* **Althæa ficifolia.**

AOTUS (from *a*, without, and *ous*, an ear; in allusion to the absence of appendages in the calyx, which distinguishes it from its allied genus, *Pultenæa*). ORD. *Leguminosæ*. Elegant little greenhouse evergreen shrubs, with yellow flowers, and simple, linear-subulate leaves, revolute at the margins, alternate or nearly opposite, or three in a whorl. They should be grown in a compost of equal parts loam, sand, and peat, with a little charcoal, and the pots should be well drained. Cuttings of half-ripened wood, made in April, root freely in sand, under a bell glass.

A. gracillima (most slender).* *fl.* yellow and crimson, small, on long, dense, graceful spikes, which are often over a foot long; pedicels short. May. *h.* 3ft. New Holland, 1844. A very pretty slender growing shrub.

A. villosa (soft-haired). *fl.* axillary, disposed in racemose spikes along the branches; calyx silky. April. *l.* smoothish on the upper surface. *h.* 1ft. to 2ft. New Holland, 1790.

APEIBA (the native name in Guiana.) ORD. *Tiliaceæ*. Very handsome stove evergreen trees or shrubs, clothed with starry down. Flowers large, golden yellow, pedunculate, bracteate. Capsule spherical, depressed, rough from rigid bristles. Leaves broad, alternate, entire or serrate. They thrive in a mixture of loam and peat. The best way to induce them to flower in this country is by cutting a ring round the bark of a large branch; by this means the growth is stopped. Well ripened cuttings should be planted in sand in heat, under a bell glass, which should be tilted occasionally, so as to give a little air to the cuttings, otherwise they are apt to damp off.

A. aspera (rough).* *fl.* golden-yellow; peduncles opposite the leaves, branched, many-flowered. May. *l.* ovate-oblong, somewhat cordate, quite entire, smooth. *h.* 30ft. to 40ft. Guiana, 1792.

A. Petoumo (Petoumo). *fl.* yellow, similarly disposed to *A. aspera*. August. *fr.* clothed with bristles. *l.* ovate-oblong, somewhat cordate at the base, entire, hoary beneath. *h.* 40ft. Guiana, 1817.

A. Tibourbou (Tibourbou).* *fl.* dark yellow. August. *fr.* densely clothed with bristles. *l.* cordate, ovate-oblong, serrated, hairy beneath. *h.* 10ft. Guiana, 1756.

APENULA. A synonym of **Specularia.**

APETALOUS. Without petals.

APEX. The summit or point of anything.

APHELANDRA (from *apheles*, simple, and *aner*, a male; the anthers being one-celled). ORD. *Acanthaceæ*. Very handsome stove evergreen shrubs, mostly of an erect habit of growth, and having handsome shining leaves, which in some instances are variegated. Flowers produced in terminal four-sided spikes—the preponderating colours being brilliant shades of orange or scarlet—conspicuously situated above the foliage; they are exceedingly attractive; corolla ringent, two-lipped, upper lip three-lobed; central lobe large. They blossom generally during the autumn months, and if the plants are removed to a warm dry atmosphere so soon as the flowers begin to open, they will continue much longer in perfection than if left in the moisture-laden atmosphere of the stove. From the time the flower spikes are at first seen till they blossom, the plants will derive much benefit from frequent applications of clear manure water. When the plants have finished flowering, they should be allowed to rest, by reducing the supply of water, but never allow them to shrivel. During this time they may be kept in a house or pit, where the atmosphere is rather dry, with a night temperature of 50deg. to 55deg. Here they may remain till March, when

Aphelandra—*continued.*

they should be pruned. This operation is commenced by thinning out the weakest shoots altogether, and cutting the others back to one or two of the strongest joints or buds above the old wood in order to keep the plants dwarf and bushy. When pruned, the plants should be placed in the stove, giving moderate supplies of water at the roots, and occasionally sprinkling the stems overhead till growth commences. When the young shoots have attained an inch or so in length, the plants should be turned out of the pots, removing the crocks and as much of the old soil as can be got away easily, at the same time shortening-in any of the straggling roots. They should then be placed into smaller-sized pots, keeping them rather close, and watering them carefully for a time till growth has commenced. When fairly started, they may be transferred into larger-sized pots, in which they are to flower. During the summer, these plants require a moist atmosphere, with a temperature of 65deg. by night, allowing it to rise 15deg. or 20deg. by day, and whilst active growth is taking place they should be frequently supplied with moisture at the roots, keeping them well exposed on all sides to the light. After growth has commenced, it is not advisable to stop the shoots, for the stouter and stronger they grow up the finer will be the flower spikes when they appear. The compost should consist of equal parts fibry loam, leaf soil, and peat, with a good proportion of sand added. In preparing it, it should be rather lumpy, and, before using, should be warmed to about the temperature of the house in which the plants are grown. Clean pots and perfect drainage are most essential. Cuttings are best prepared from half ripened wood, or taken off when young with a heel. The base of each cutting should invariably be cut clean across. These may be inserted an inch apart, in pots of sandy soil, and plunged in a brisk bottom heat. To obtain young shoots for cuttings, if the old plants break freely after pruning, and very large specimens are not required, when the shoots are 2in. long they should be thinned out, leaving the requisite number of the strongest to form the plant. If the surplus pieces are removed with a slight heel of the older wood, they make good cuttings, and should be treated the same as the others. These cuttings strike root quickest, and when rooted, if potted into 5in. or 6in. pots, and allowed to grow up without stopping or pinching out the tops, they will flower the first season. Although Aphelandras can be grown into large sized specimens, it will be found to be more generally satisfactory to have specimens of neat and moderate dimensions. The mealy bug and scale insects are very troublesome, and must be kept down, otherwise they will prove most prejudicial to the plants.

A. acutifolia (acute-leaved). *fl.* large, deep vermilion red; the upper lip of corolla concave, and projected forward, the lower one consists of three oblong-obtuse spreading lobes. October. *l.* broad, oblong-ovate, acuminate. Columbia, 1868.

A. aurantiaca (orange-coloured).* *fl.* deep orange scarlet; upper lip of corolla erect, bidentate, concave; lower one spreading horizontally, three lobed. December. *l.* broad, ovate, opposite, dark green, somewhat wavy at the edge. *h.* 3ft. Mexico, 1844.

A.a. Roezlii (Roezl's).* Differs chiefly from the type in the curiously twisted leaves, which are dark green, shaded with a silvery hue between the primary veins; in the brighter scarlet of the flowers; and a few other, but purely technical, points. It is one of the best. Mexico, 1867. SYN. *A. Roezlii*.

A. cristata (crested).* *fl.* brilliant orange scarlet, 2in. or 3in. long, in large terminal branching spikes. August to November. *l.* large, broadly ovate, and tapering to a point. *h.* 3ft. West Indies, 1733. A handsome and continuous blossomer. SYN. *Justicia pulcherrima*.

A. fascinator (fascinating).* *fl.* bright vermilion, in very large spikes. Autumn. *l.* ovate acuminate, olive green, beautifully banded with silvery white, whilst the under side is of a uniform purplish violet. *h.* 1½ft. New Grenada, 1874.

A. Leopoldi (Leopold's).* *fl.* citron-yellow. *l.* opposite, ovate-oblong, acuminate; ground colour on the upper surface dark green, the midrib and primary veins pure white; under surface uniformly pale green. Brazil, 1854.

A. medio-aurata (golden-centred). *fl.* unknown. *l.* ovate-lanceolate, sinuate, bright green, with yellow central brand. Brazil, 1871. SYN. *Graptophyllum medio-auratum*.

Aphelandra—*continued.*

A. nitens (shining).* *fl.* glowing vermilion-scarlet, very large, in erect, simple, terminal spikes, which, after the flowers have fallen, are clothed with the imbricating, lanceolate, appressed bracts. *l.* ovate, sub-acute, leathery, brilliant glossy on the upper surface, dark vinous purple underneath. *h.* 2ft. to 3ft. Columbia, 1867.

A. Porteana (Porte's).* *fl.* in fine terminal heads; corolla and bracts bright orange. *l.* rich green, with metallic silvery-white veins. *h.* 2ft. Brazil, 1854.

A. pumila (dwarfish).* *fl.* orange-coloured; upper lip erect, concave, entire; bracts large, purplish. *l.* large, cordate, ovate-oblong, acute. *h.* 8in. Brazil, 1878. Very distinct from all others.

A. punctata (dotted).* *fl.* bright yellow, in large and rather dense spikes; the spiny-edged long pointed bracts are also yellow, with the exception of the tip, which is green, and forms a pleasing contrast. November. *l.* opposite, elliptic, acuminate; the green midrib is conspicuous in the middle of a white central band, which also extends beside the green veins, this silvery band breaking up on its margin into numerous small white dots, producing a pretty and distinct form of variegation. South America, 1881.

A. Roezlii. A synonym of *A. aurantiaca Roezlii.*

A. variegata (variegated). *fl.* yellow; spike, 6in. long, with bright orange-red bracts. *l.* ovate-lanceolate, acuminate, dark green with white veins. *h.* 1½ft. Brazil.

APHELEXIS (from *apheles*, simple, and *exis*, habit). ORD. *Compositæ.* A genus of elegant dwarf evergreen greenhouse shrubs. Flower-heads large, solitary, or small and two or more together. Leaves small. These plants are valuable for exhibition purposes, on account of their bright colours, and the length of time they last in perfection; they are included among what are familiarly known as "everlastings." The most suitable soil is a compost of two parts of good fibrous peat and one of leaf mould, with a liberal supply of silver sand, and a few pieces of charcoal added to it. Repot the plants firmly in February, and allow thorough drainage. Cuttings can be made in spring or summer; small half-ripened side shoots are best; and these will root in sandy soil, under a bell glass, in a cool greenhouse.

A. ericoides (Heath-like).* *fl.-heads* white. April. *l.* very small, three-cornered, imbricated, appressed; branches numerous, very fine, filiform. *h.* 1ft. Cape of Good Hope, 1796.

A. fasciculata (fascicled). *fl.-heads* purplish, solitary, terminal; peduncles scaly. March. *l.* acerose linear, roundish, downy above; lower spreading; upper appressed. *h.* 2ft. Cape of Good Hope, 1779. There are two or three forms of this species, varying in the colour of the flowers.

A. humilis (humble, or dwarf).* *fl.-heads* pink, solitary, terminal, opening only in sunshine; peduncles scaly. April. *l.* subulate, erect, imbricate. Branches numerous, slender, covered with white tomentum. *h.* 2ft. Cape of Good Hope, 1810. A handsome greenhouse plant, with much-branched stems, terminated by the flower-head. SYNS. *A. macrantha* and *Helipterum humile.*

A. h. grandiflora (large-flowered).* *fl.-heads* rosy-purple, produced in great abundance. Habit rather dwarf, and free branching. Very highly esteemed.

A. h. purpurea (purple).* *fl.* dark purple, very abundant. *l.* silvery white and shining. A vigorous grower, and perhaps the best for exhibition purposes. It is known in gardens as *A. macrantha purpurea*; also under the name of *A. spectabilis.*

A. h. rosea (rose-coloured).* *fl.-heads* delicate rose, very profuse. Habit very compact and free-branching. A very showy and desirable variety, known in gardens as *A. macrantha rosea.*

A. macrantha (large-flowered). Synonymous with *A. humilis.*

A. sesamoides (Sesamum-like). *fl.-heads* purple and white, sessile, solitary, terminal. April. *l.* acerose linear, keeled, smooth, appressed. *h.* 2ft. Cape of Good Hope, 1739.

APHIDES, or **PLANT LICE.** These belong to the order *Homoptera*, meaning "same winged," and the name has reference to the fact that the fore wings are uniform in their structure from base to apex, not divided into a leathery base and a membranous tip. Aphides are all minute in size, soft bodied, and generally long legged; the mouth is furnished with a curiously-constructed beak, or rostrum, for sucking the juice of plants; the antennæ, or feelers, are long and slender; the legs have usually two joints in the tarsi, one of which is generally very ill-developed; and near the tip of the abdomen, on the back of a ring, in many kinds, stand two prominent tubes, called honey-tubes, from which a sweet secretion, much sought after by ants, is emitted. They are very destructive, and nearly every

Aphides—*continued.*

plant has its own peculiar Aphis; but among the worst are the cherry fly and bean fly. All these insects are very destructive to the young shoots and foliage of plants, on which they cluster in large numbers, sometimes completely hiding the stems, increasing with marvellous rapidity. They produce eggs in autumn, which lie dormant through the winter, and upon the approach of warm weather in spring, hatch and produce individuals which, during the summer, are viviparous, budding off young insects at a surprising rate, which quickly in turn become possessed of the same marvellous power; hence the enormous number which are produced in so surprisingly short a time. It has been computed that in a few weeks many millions of young might be produced directly or descended from a single female. *See also* **Black Fly** and **Bean Fly.**

The following remedies may be successfully employed:

Tobacco. This is applied, as a rule, in three forms, each of which is useful for particular purposes. Tobacco powder is useful as a dry application to plants where, from any cause, the other modes of employing it are not desirable. It causes no smell, and is useful in conservatories, &c., for that reason. The mode of applying it is to dredge or dust it over the foliage of the plants affected, and to syringe off in from three to thirty hours, according to the nature of the plants. Fumigation with tobacco, if done in a proper way, is very effective, but it leaves an unpleasant smell. The foliage of the plants should be quite dry, and a still day must be chosen for the work; the house should be filled with smoke, but no flame must arise in the burning. The plants should be well syringed the next morning, and full ventilation allowed; if the fumigation is repeated twice or thrice, it will prove very effectual. Tobacco water is made by soaking a pound of coarse shag in 6gals. of hot water, to which ½lb. of size or soft soap has been added. The plants should be dipped into or syringed with this mixture, and well syringed with clean tepid water about twelve hours after. It should not be employed for plants having woolly or hairy foliage. Tobacco paper and cloth are used for fumigating in the same manner as tobacco; but as they vary in strength, more care is necessary, as they sometimes cause the leaves to become spotted. Judiciously employed, they are cheaper than Tobacco.

Quassia. Boil 1lb. quassia chips in 4gals. of soft water, for about ten minutes, and after straining off the chips, add 1lb. of soft soap. Apply in the same way as Tobacco water, and syringe the plants with clean water after ten minutes or a quarter of an hour.

Soft Soap. This, in proportion of 8lb. to 12gals. of rain water, and 1gal. of tobacco water added after it is cold, is a cheap and good remedy out of doors, and requires the same mode of application as tobacco water.

Soap Suds. Where bleaching powder, or much soda, is not mixed with these, they make a good insect killer for hard-foliaged plants, but should be washed off with clean water in twelve hours. No mixture containing chloride of lime should be used.

Various. Fir-tree Oil, Gishurst's Compound, and Fowler's Insecticide, are all serviceable, if used as directed on the labels. Hardeman's Beetle Powder, applied with the little French powder-bellows which is sold with it, is very efficacious. For outdoor work, nothing surpasses clean cold water, applied often and forcibly with a syringe.

The best mode of clearing Aphis off Beans, Currants, &c., is to remove the tops of the infested shoots, and to wash the plants with soapy water, or a solution of Gishurst's Compound. In some cases, a good dusting with soot and wood ashes, while the plants are wet, will keep them in check. The "Golden Eyes" or "Lacewing" fly, and also ladybirds, are to be encouraged, as the larvæ of each of these wage incessant war against Aphides, especially the green varieties, and thin them out considerably.

APHROPHORA. *See* **Frog Hopper.**

APHYLLANTHES (from *aphyllos*, leafless, and *anthos*, a flower; the flowers are on Rush-like branches). ORD. *Liliaceæ*. A very pretty Rush-like hardy perennial, forming dense, erect tufts. It thrives best in sandy peat, requires a warm sunny situation, and slight protection in winter. Increased by division of the roots, and seeds; the latter should be sown in pots in a cool greenhouse as soon as ripe.

A. monspeliensis (Montpelier).* *fl.*, perianth six-cleft, spreading at the apex, deep blue, nearly an inch across, disposed in a small head, on slender scapes. June. *l.* absent; the very slender scapes are leaflike, with membranous sheaths at the base. South of France, 1791.

APHYLLOUS. Without leaves.

APICRA (from *apicros*, not bitter). ORD. *Liliaceæ*. A group of succulents allied to *Aloe*, and having the following among other characters:—Flowers small, loosely subspicate; perianth regular, cylindrical, with short spreading segments; peduncles simple or forked. Plants small; rosette leaves always elongated. Leaves thick, diffuse, never spinosely dentated. They require treatment similar to **Aloe**, under which genus they are included by some authors.

A. aspera (rough).* *fl.*, perianth ½in. long; raceme loose, 3in. to 4in.; pedicels three to four lines long; peduncle slender, simple, nearly 1ft. *l.* dense, in many rows, spreading, rounded, deltoid, six to seven lines long and broad; face rather flat; middle three to four lines thick; back convex hemispherical, wrinkled. Cape of Good Hope, 1795.

A. bicarinata (double-keeled).* *fl.* unknown. *l.* dense, in many rows, ascending, deltoid-lanceolate, nine to twelve lines long, six lines broad, dirty green; face flat; middle two lines thick; margin scabrous; back copiously tubercled. Cape of Good Hope, 1824.

A. congesta (congested). *fl.*, perianth six to seven lines, whitish; raceme loose, sub-spicate, about 1ft.; pedicels short; peduncles 6in. long, simple. *l.* dense, spreading, in many rows, deltoid-lanceolate, eighteen to twenty-one lines long, three to four lines thick; back convex; top unevenly keeled towards the margins. 1843.

A. deltoidea (deltoid). *fl.*, perianth greenish, five to six lines long; raceme about 1ft. long, sub-spicate; pedicels short; peduncles 6in., simple or branched. *l.* in five regular rows, spreading, nine to twelve lines long, deltoid, shining green; when mature, upper surface rather flat, apex pungent; middle two to three lines thick; back distinctly keeled upwards; margins and keels minutely serrated. South Africa, 1873.

A. foliolosa (small-leafy).* *fl.*, perianth greenish, five to six lines long; raceme loose, sub-spicate, about 1ft.; pedicels two to three lines long; peduncle 6in., simple. *l.* dense, spreading, in many rows, rounded deltoid, cuspidate, six to eight lines long and broad, without spots or tubercles; face rather flat; middle one and a half to two lines thick; back obliquely keeled upwards towards the margins. Cape of Good Hope, 1795.

A. imbricata (imbricated). Synonymous with *A. spiralis*.

A. pentagona (five-angled).* *fl.*, perianth whitish, ½in. long; raceme about 1ft., loose; lower pedicels two to three lines long; peduncles 1ft., often branched. *l.* dense, regular, lower ones spreading, upper ones ascending, lanceolate-deltoid, fifteen to eighteen lines long; bottom six to eight lines broad, shining green; face flat; middle three to four lines thick; apex pungent; margin scabrous; back irregularly one to two keeled at top. Cape of Good Hope, 1731.

A. p. bullulata (little-blistered). *l.* irregularly spiral, five rowed; back with spreading close wrinkled tubercles.

A. p. spirella (small spiral). *l.* smaller and more deltoid, 1in. long, six to eight lines broad at the bottom, irregularly five rowed, or as if in many rows.

A. spiralis (spiral).* *fl.*, perianth reddish-white, ½in. long; raceme loose, nearly 1ft.; pedicels ascending, two to three lines long; peduncles 6in., simple or branched. *l.* dense, in many rows, strong, ascending, lanceolate-deltoid, twelve to fifteen lines long, six to eight lines broad; face almost flat, without tubercles; apex pungent; back swollen, scarcely keeled; margins obscurely crenulated. Cape of Good Hope, 1790. SYN. *A. imbricata.*

APICULATE, APICULATED. Terminated in a little point.

APIOS (from *apion*, a pear; in reference to the form of the tubers of the root). ORD. *Leguminosæ*. An elegant little hardy twining perennial, easily trained into almost any shape. It must have a well-exposed, sunny position, and the soil should be of a warm or light sandy nature. Propagated by division of the tubers.

Apios—*continued.*

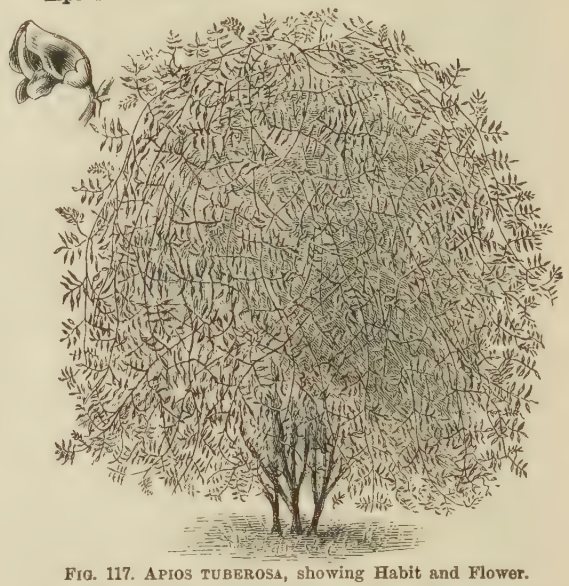


FIG. 117. APIOS TUBEROSA, showing Habit and Flower.

A. tuberosa (tuberous).* Ground Nut. *fl.* brownish-purple, sweet-scented, in axillary racemes. Summer and early autumn. *l.* pinnate. Tubers edible, farinaceous. Habit very light and graceful. Pennsylvania, 1640. SYN. *Glycine Apios.* See Fig. 117.

APIOSPERMUM. A synonym of **Pistia** (which *see*).

APIUM (from *apon*, Celtic for water; in reference to the habitat). ORD. *Umbelliferæ*. This genus contains no species worth growing for ornament, and nearly all are more or less acrid and poisonous. *A. graveolens* is the Celery of gardens, for culture of which, *see* **Celery.**

APLECTRUM (from *a*, without, and *plectron*, a spur; flower spurless). ORD. *Orchideæ*. A monotypic genus from North America. A curious, hardy, terrestrial orchid, requiring a shady spot in light loam and leaf mould, moderately damp. Very difficult to cultivate.

A. hyemale (wintry).* *fl.* greenish-brown, large, racemose, borne on a naked scape after the leaves have died down; labellum as long as the sepals; column sessile, rather long, wingless. April. Stem pseudo-bulbous, with one large, broad, ribbed leaf. *h.* 1ft. 1827.

APLOTAXIS. Included under **Saussurea** (which *see*).

APOCARPOUS. Having the carpels or fruit separate, or disunited.

APOCYNACEÆ. A large order of trees, shrubs, or rarely herbs, usually with a poisonous, milky sap. Flowers regular, solitary or corymbose; corolla salver-shaped or campanulate. Leaves simple, opposite, sometimes alternate or whorled. Well known genera belonging to this order are: *Allamanda*, *Nerium*, *Tabernæmontana* and *Vinca*.

APOCYNUM (from *apo*, away, and *kyon*, a dog; adopted by Dioscorides, because the plant was supposed to be poisonous to dogs). ORD. *Apocynaceæ*. Dog's Bane. Perennial erect herbs, with cymose flowers and membranous, opposite leaves. There are several species belonging to this genus, but only the one described below is worthy of being cultivated. They are of extremely easy culture, thriving in any ordinary soil; and may be propagated by suckers, divisions, or seeds. The best time to divide is just as they are starting into fresh growth in spring.

A. androsæmifolium (Tutsan-leaved).* *fl.* pale red, with darker stripes; corolla campanulate; cymes terminal and lateral. July. *l.* ovate, glabrous, petiolate, pale beneath. *h.* 1ft. to 2ft. Virginia, and Canada, 1683. A very old garden favourite, thriving best in peaty soil, with Azaleas, &c. See Fig. 118.

FIG. 118. INFLORESCENCE OF APOCYNUM ANDROSÆMIFOLIUM.

APONOGETON (from *apon*, Celtic for water, and *geiton*, neighbour; alluding to the habitat of these plants). ORD. *Naiadaceæ*. Very ornamental aquatic perennials. There are several species, but *A. distachyon* is superior to the others. This species may be cultivated in small tanks or aquaria; it delights in an abundance of light and air, and is perfectly hardy, having become naturalised in many parts of the country. Pot the plants in rich sandy loam and rotten cow manure, using, of course, small pots, if the vessel in which it is to be grown is restricted. When introducing it to large tanks or lakes, commence with strong, previously well-established plants, in large pots, breaking the latter when the plants are immersed. Place them in positions where the water is about 1ft. 6in. to 2ft. deep; they will then rapidly increase by offsets and seeds, and, when established, will flower nearly all the year round. The other kinds will thrive with the same treatment; but they are neither so hardy nor so vigorous, and should only be grown in small tanks or aquaria.

FIG. 119. APONOGETON DISTACHYON, showing Habit and Flower-spikes.

Aponogeton—*continued.*

A. angustifolium (narrow-leaved). *fl.* white. July. Cape of Good Hope, 1788. Half hardy.

FIG. 120. APONOGETON DISTACHYON, showing Flower-spikes, Leaf, and Root.

A. distachyon (two-spiked).* Cape Pond Weed; Winter Hawthorn. *fl.* with a delicious Hawthorn-like perfume; petals none; bracts, or showy portion oval, entire, white; anthers purple-brown; scape two-spiked, each spike being from 2in. to 4in. long. *l.* oblong-lanceolate, entire, bright green, on long stalks, floating. Cape of Good Hope, 1788. See Figs. 119 and 120.

A. monostachyon (simple-spiked). *fl.* pink. September. *h.* 1ft. East Indies, 1803. Stove species. Rare.

A. spathaceum junceum (Rush-like).* A very pretty, but rare, half-hardy aquatic plant, with the forked inflorescence having both bracts and flowers suffused with a delicate blush colour. *l.* Rush-like, standing clear up out of the water. South Africa, 1879.

APORETICA. A synonym of **Schmidelia** (which *see*).

APPENDICULATE, APPENDICULATED. Having appendages.

APPLANATE. Flattened out.

APPLE (*Pyrus Malus*). The Apple is one of the most useful, and probably most largely cultivated, of our hardy fruits. It is known as the Crab in its wild state, and is indigenous to Britain and to all the temperate and warmer parts of Europe. It is supposed that the progenitors of the varieties now grown were introduced to this country at various times from the Continent, and not obtained here as direct improvements on the native Crab. Those now

FIG. 121. APPLE BLOSSOM.

cultivated are extremely numerous, and include good varieties that can be made to prolong the season all the year round. Apart from its great value as a fruit, the apple is a strikingly handsome tree when in flower (see Fig. 121). A fruiting branch is shown at Fig. 122.

FIG. 122. FRUITING BRANCH OF APPLE.

Propagation. Seeds are sown extensively, chiefly for raising stocks to graft approved sorts on; also with a view to raising new varieties. The seeds do not retain their germinative properties very long, consequently they must be sown soon after being taken from the fruit. As grown in this country, they are generally sown in the autumn,

Apple—*continued.*

transplanted the following year, and so on until they are of sufficient size for Grafting purposes. The standard of excellence being at present so high, improved forms raised from seed are comparatively scarce.

Grafting. This method of propagation is the one generally adopted for most purposes, the stocks being previously prepared for size or height of tree required. Cordon and other dwarf-trained trees should be worked near but not below the ground, while standards are best worked on stocks of the desired height. The practice of working standard trees low, and growing the scion to form the stem of the future tree, is not recommended, as many of the tenderer sorts will not grow straight or strong enough for the purpose. Whip-grafting is the most preferable mode adopted. The scions should be selected from healthy trees not later than January, and laid in singly in the ground until the stocks have slightly advanced in growth, which is generally about the middle of April. Several other methods of Grafting may be adopted with success, but the one above recommended is considered the best.

Budding. Apples may be successfully propagated by Budding, and this method is practised much more now than formerly. It has many advantages, as it requires to be performed at a season when there is not so much work in hand. It should be done in damp, dull weather, if possible, as the weather if dry soon destroys the buds. July and August is the proper time for the purpose. The stocks and woods from which the buds are taken should be as much as possible in the same condition.

Propagation by Cuttings, Layers, &c. This system may be made use of in the case of new varieties or where it is desired to increase any one variety with a limited number of scions, but the results are uncertain—at least in the case of cuttings; consequently, it is much better to resort to the safer method of Grafting.

Pruning. *See* **Pruning.**

Training. *See* **Training.**

Planting. The best time to plant is as soon as most of the leaves have fallen, which is generally about the end of October. The roots being then in an active state, and the ground still retaining a certain amount of heat, they will form new roots before winter, which is a material advantage. Where it is impossible to plant at this time, it may be done in suitable weather any time during the winter, but it is best not deferred till spring. It is important in planting that the soil should be moderately dry and free from frost; this condition cannot always be obtained during winter. The effects of soil and situation have a very important bearing on the Apple, specimens of the same sort from different places being often hardly recognisable. Although not over fastidious in the matter of soil as far as growing is concerned, the best results are obtained where it is of a rich loamy character and well drained. Dry, sandy soils invariably produce canker, while the trees are often overgrown with lichens in undrained land. The addition of heavier loam, or sometimes trenching and mixing the sub-soil with that at the top, will convert light soils into those suitable for Apple culture; while, on the other hand, heavy soils may be improved by drainage, the addition of lime, vegetable refuse, burnt earth, and other matters. Rank manure should on no account be used anywhere near the roots, but a little well-decayed manure, mixed with the soil or used as a mulching, is beneficial. The site best suited is an open, though not exposed one, with a south, south-east, or south-west aspect. Shelter from north-east winds in spring, which destroys the blossom, and from west and south-west winds in autumn, which blow down the fruit, should be the aim of cultivators. Planting in a valley should be avoided on account of spring frosts. In Planting, care must be taken to make the bottom of the hole tolerably firm, and slightly raised under the base or bole of the tree. The roots should then be

Apple—*continued.*

carefully spread out all round, and if any have been ruptured in transplanting, cut them clean off on the upper side, thus inducing new roots to be formed near the surface. The soil should be trodden firmly after a quantity has been filled in, if it is in a dry, suitable condition, as previously recommended. Secure with stakes in proportion to the size of tree, or injury will be caused by the wind. The distance at which Apple trees are planted varies considerably. Standards in orchards may be planted in good soil, from 20ft. to 40ft. apart, especially if they are strong-growing culinary sorts. Pyramids may be planted from 5ft. to 15ft., according to size; and similar distances will suit Bush trees. The oblique Cordon system of training admits of a large number of varieties being cultivated in a small space, as they may be planted as close as 18in. or 2ft. apart. Horizontal Cordons should be planted about 5ft. asunder, and one branch trained each way. Watering will be necessary after planting in most cases, especially should the winter and following season be at all dry. Thinning the fruit is sometimes advisable for obtaining good specimens, but it is not generally necessary, at least with many of the shy-setting sorts. If, however, the crop should be exceptionally heavy, it is best to thin the fruit, or the tree may be unable to make and ripen its wood for the crop of the succeeding year.

Gathering. The three following tests are sure indications of the gathering period: (1) The apples will begin to fall of their own accord; (2) their seeds will be plump and brown in colour; and (3) the fruit will separate with a mere touch from the trees; the second test may be said to be infallible. All Apples should be gathered before the end of October, for none will bear frost with impunity. They must be gathered in dry weather, and handled with the greatest care, laid gently in baskets and trays, in single file only, and conveyed to the store room.

Storing. The simplest and best method is in choosing or forming some room or place free from extremes of heat and cold, dryness or damp, where a temperature of about 45deg. is maintained A current of air is not necessary. The shelves should be made of poplar, sycamore, lime, or other white wood. Deal, oak, ash, elm, and almost all other woods, give a bad taste to the fruit. One sheet of paper—and paper only—should be placed under the fruit. They ripen best, and are of the highest flavour when left fully exposed to the free atmosphere of the fruit room, and in order to preserve a more even temperature the light should be shut out. Early and late ripening varieties must be stored in separate places, as well as all inferior or injured fruit. The plan of isolating each fruit by packing in tissue paper, sand, burnt earth, or other substances, often destroys the flavour of the fruit, and possesses no material benefit otherwise.

Diseases. Apple Mussel Scale, Apple or Codlin Grub, Canker, Mildew, American Blight, Scale, and Insect Pests, such as Caterpillars and Weevils, *see* under their separate headings.

Varieties. The following are some of the best varieties in cultivation:—

Adams' Pearmain. Dessert. Fruit medium, very handsome; flavour juicy and sugary. December to March.

Alexander. Kitchen. Very large, showy, and good. September to December.

Alfriston. Kitchen. Very fine, large, white flesh. November to April.

Ashmead's Kernel, or **Cockle Pippin.** Dessert. Fruit below medium; flavour very rich and sugary. This variety is, according to Mr. Rivers, much esteemed in Gloucestershire. November to January.

Bedfordshire Foundling. Kitchen. Fruit large. One of the finest and most useful sorts, a great bearer. February to May.

Bess Pool. Kitchen. Fruit large. Good late cooking apple. December to May.

Betty Geeson. Kitchen. Fruit large, produced in great abundance. February to May. A valuable sort.

Apple—*continued.*

Blenheim Pippin. One of the best kitchen sorts. November to February.

Boston Russet. Dessert. Fruit medium; flavour very sugary and rich, similar to the Ribston Pippin. An excellent American variety. January to May.

Brabant Bellefleur. Kitchen. Fruit large, round, pale yellow, red-streaked. A most useful cooking variety, also useful for dessert. November to April.

FIG. 123. APPLE, CALVILLE BLANCHE.

Calville Blanche. Dessert. Fruit large; flavour first-class. October to December. See Fig. 123.

Cellini. Kitchen. Fruit perfect in form, size, colour, and quality. October to January.

Claygate Pearmain. Dessert. Fruit medium; flavour rich, aromatic, excellent, same as Ribston Pippin. January to May.

Coe's Golden Drop. Dessert. Fruit small, with a crisp and juicy flavour. November to January. A delicious variety.

Cornish Aromatic. Dessert. Fruit medium; flavour rich, juicy, and aromatic. October to December.

Cornish Gillyflower. Dessert. Fruit medium; flavour very rich, quite aromatic. October, November to January. An excellent variety, thriving best in a warm situation.

Court of Wick. Dessert. Fruit medium, very handsome; flavour somewhat similar to Golden Pippin. December to March.

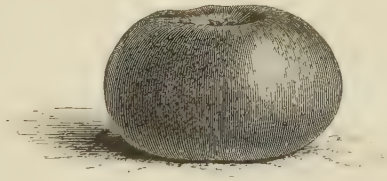


FIG. 124. APPLE, COURT PENDU PLAT.

Court Pendu Plat. Dessert or kitchen. Fruit medium, rich russet brown, of first-rate quality, and the tree is a good cropper. November to April. See Fig. 124.

Cox's Orange Pippin. Dessert. Fruit medium, very handsome; flavour rich aromatic. October to December. One of the best apples grown.

Cox's Pomona. Kitchen. Fruit very large, of superior quality. October.

Devonshire Quarrenden. Dessert. Fruit medium, excellent quality, and handsome. July to September. A very prolific sort.

D. T. Fish. Kitchen. Fruit large, roundish, of a clear straw-colour, with small specks of russet, slightly flushed with crimson on the side where the sun strikes it; flavour sub-acid. November to January. A fine and handsome variety.

Duchess of Oldenburgh. Kitchen. Fruit large, red-striped. August to October. A very desirable and handsome Russian variety.

Duke of Devonshire. Dessert. Fruit medium; flavour crisp, juicy, rich and sugary. December to March.

Dumelow's Seedling, or **Wellington,** or **Normanton Wonder.** Kitchen. Fruit firm, large, and somewhat acid. November to March.

Early Harvest. Dessert. Fruit medium; flavour juicy, excellent, with a pleasant sharpness. July to September. According to Mr. Rivers this variety is equally good for cooking or dessert, and is a very fertile tree on the Paradise stock.

French Crab. Kitchen. Fruit large, pale green, firm, acid. An excellent sort, and the longest keeper.

Golden Pippin. Dessert. Fruit small, very excellent flavour. November to January. A well-known and highly-esteemed sort.

Apple—*continued.*

Golden Reinette. Dessert. Fruit rather small, yellowish red, streaked with red; flavour excellent, sweet and rich. One of the best and most useful of dessert apples. October to December.

Gravenstein. Kitchen. Fruit large, handsome, sweet and crisp. November to January. A very prolific sort.

Greenup's Pippin. Kitchen. Fruit very large. February to May. A vigorous grower and abundant bearer.

Irish Peach. Dessert. Fruit medium, yellowish-green, very early; flavour juicy, excellent. July and August. A very good variety, often known as Early Crofton.

Jolly Beggar. Kitchen. Fruit large, pale yellow, tender and juicy. November to January, A very desirable sort and an extraordinary cropper.

Keddlestone Pippin. Dessert. Fruit small, yellow or golden colour, specked with russet; flavour delicious, highly aromatic. December to March. An excellent variety.

Kerry Pippin. Dessert. Fruit medium, firm, yellow, and red; flavour sugary and rich. September to October.

Keswick Codlin. Kitchen. Fruit large and early. August to October. An admirable sort for market purposes.

King of the Pippins. Dessert. Fruit medium, yellow and red; flavour juicy and rich. October to January.

Lady Henniker. Kitchen. Fruit yellow, with crimson streaks near the sun, highly flavoured, and with a pleasant perfume. February to May. An excellent sort, suitable for dessert or kitchen.

Lodgemore Nonpareil. Dessert. Fruit small; flavour rich, sugary, and aromatic. January to May. An excellent sort.

Lord Suffield. Kitchen. Fruit very large, white, soft, excellent for sauce and tarts. August to September.

Manx's Codlin. Kitchen. Fruit large. September and October. One of the finest and most useful of kitchen sorts.

Mère de Ménage. Kitchen. Large and good. October to March.

Mr. Gladstone. Dessert. Fruit large and handsome, very early, scarlet cheek, striped and shaded; of excellent quality. July and August. New.

New or **Winter Hawthornden.** Kitchen. Fruit very large, excellent. November to January. An extraordinary bearer, one of the best for sauce and cooking.

Nonsuch. Kitchen. Fruit large, juicy. August to October. An admirable sort, unequalled for sauce and cooking.

Norfolk Beefing. Kitchen. Large and good flavour, excellent keeper, most useful for baking whole and preserving. November to July.

Norfolk Greening. Kitchen. Fruit medium; rather acid. Keeps till April or May.

Northern Spy. Dessert. Fruit large, tender; flavour highly aromatic. December to May.

Old Nonpareil. Dessert. Fruit medium, tender, and juicy. November to January. A prolific variety.

Pitmaston Pineapple. Dessert. Fruit small; flavour very rich. July to September. According to Mr. Rivers this variety is a very abundant bearer on the Paradise stock; it is not a vigorous grower.

Red Astrachan. Dessert. Fruit good size, bright; flavour delicate and rich. August to September.

Red Ingestrie. Dessert. Fruit very pretty bright red next the sun, on a yellow ground, flesh pale yellow; flavour brisk and sparkling, like the Golden Pippin in quality. August and September. An excellent sort.

Red Juneating, or **Margaret.** Dessert. Fruit medium, early, very good quality. July and August. A well-known sort, with numerous synonyms.

Red Quarrenden. Dessert. Fruit under medium, bright scarlet; flavour crisp and sweet. August. One of the best summer sorts.

Reinette du Canada. Dessert. Fruit greenish-yellow and brown, large; flavour juicy, brisk, sub-acid. November to May. See Fig. 125.

Reinette Grise. Dessert. Flesh yellowish-white, sugary, pleasant; flavour sub-acid. November to April. It does best on the Paradise stock, and is an abundant cropper. See Fig. 126.

Ribston Pippin. Dessert. Fruit greenish-yellow and red, medium; flavour rich, aromatic, excellent. October to December.

Sam Young. Dessert. Fruit small, yellowish with russet spots; flavour delicious, tender, and juicy. October to December. An excellent Irish sort.

Scarlet Crofton. Dessert. Fruit medium, yellow and red; flavour crisp, juicy, and sweet. October to December.

Scarlet Nonpareil. Dessert. Fruit well coloured, large; flavour crisp and juicy. January to March.

Small's Admirable. Kitchen. Fruit large, green, crisp, sweet, and juicy. November to January. A prolific cropper.

Apple—*continued.*

Stamford Pippin. Dessert. Fruit large, with a brisk flavour and an agreeable aroma. November to January. A very desirable sort.

FIG. 125. APPLE, REINETTE DU CANADA.

Sturmer Pippin. Dessert. Fruit medium; flavour brisk and rich. February to June.

Syke House Russet. Dessert. Fruit small; flavour very rich. January to May. An excellent sort.

Tower of Glammis. Kitchen. Fruit yellow, very large, square-shaped, crisp, and excellent. February to May. A very excellent sort.

Van Mons Reinette. Dessert. Fruit small, with a rich, aromatic, and excellent flavour. November to January.

Waltham Abbey Seedling. Kitchen. Fruit large. November and December. An admirable sort.

Warner's King. Kitchen. Fruit large, handsome, and good. November to March.

Worcestershire Pearmain. Kitchen. Fruit large, conical, of a very brilliant colour; flavour crisp and juicy. August to October. A splendid variety, said to be as prolific as Lord Suffield.

FIG. 126. APPLE, REINETTE GRISE.

White Juneating. Dessert. Fruit small, very early, and good quality, but a bad keeper. July and August. A prolific sort.

White Nonpareil. Dessert. Fruit medium, very delicious. March to June. A very desirable sort.

Winter Quoining, or **Queening.** Dessert. Fruit very bright, almost red; flavour excellent. November to May. An excellent sort, useful for dessert or culinary purposes.

Winter Strawberry. Dessert. Fruit yellow, medium, striped with red; flavour brisk aromatic. November to March. A very useful sort.

Wormsley Pippin. Kitchen or dessert. Fruit of an excellent quality, large, pale green; excellent for kitchen or dessert. September to October.

Yorkshire Greening. Kitchen. Fruit large, juicy, tender. November to January.

For Cordons the following are the best:—BETTY GEESON, COE'S GOLDEN DROP, COX'S ORANGE PIPPIN, DUKE OF DEVONSHIRE, KING OF THE PIPPINS, LODGEMORE NONPAREIL, NORTHERN SPY, REINETTE DU CANADA, RIBSTON PIPPIN, SCARLET NONPAREIL.

For Pyramidal, Bush, and Espalier Trees, the best are:—ADAMS' PEARMAIN, ASHMEAD'S KERNEL, BOSTON RUSSET, CLAYGATE PEARMAIN, CORNISH GILLYFLOWER, COURT OF WICK, COURT PENDU PLAT, COX'S ORANGE PIPPIN, EARLY HARVEST, GOLDEN PIPPIN, GOLDEN REINETTE, IRISH PEACH, KEDDLESTONE PIPPIN, KERRY PIPPIN, RED INGESTRIE, RED QUARRENDEN, REINETTE DU CANADA, RIBSTON PIPPIN, SAM YOUNG, SCARLET CROFTON, SCARLET NONPAREIL, STURMER PIPPIN, SYKE HOUSE RUSSET, WORMSLEY PIPPIN. The following Kitchen sorts are well adapted to this method:—ALFRISTON, BED-

Apple—*continued.*

FORDSHIRE FOUNDLING, BRABANT BELLEFLEUR, CALVILLE BLANCHE, CELLINI, COX'S POMONA, D. T. FISH, DUCHESS OF OLDENBURGH, DUMELOW'S SEEDLING, JOLLY BEGGAR, KESWICK CODLIN, LORD SUFFIELD, MANX'S CODLIN, NEW HAWTHORNDEN, NONSUCH, WALTHAM ABBEY SEEDLING, WARNER'S KING.

For Cold and Exposed Situations, the following are the best:—BESS POOL, CLAYGATE PEARMAIN, FRENCH CRAB, GREENUP'S PIPPIN, KESWICK CODLIN, NONSUCH, STURMER PIPPIN, TOWER OF GLAMMIS, WINTER STRAWBERRY, WORMSLEY PIPPIN.

For Cottage Gardens: ALEXANDER, BEDFORDSHIRE FOUNDLING, BLENHEIM PIPPIN, KING OF THE PIPPINS, MANX'S CODLIN, NEW HAWTHORNDEN, REINETTE DU CANADA, RIBSTON PIPPIN, STURMER PIPPIN, WALTHAM ABBEY SEEDLING, WARNER'S KING, WORMSLEY PIPPIN.

APPLE BERRY. *See* **Billardiera.**

APPLE-BLOSSOM WEEVIL (*Anthonomus pomorum*). This is a small beetle of a reddish-brown colour, with three inconspicuous stripes of a paler colour behind the head; the wing cases show a large pitchy-coloured blotch, with oblique striæ and yellowish spots thereon. The female busily engages herself in piercing the flower buds; while the male may be usually seen flying about the trees during the breeding season, which, of course, varies according to the earlier or later expansion of the buds. The female, by means of strong jaws at the end of the long proboscis, bores a hole in the bud, in which she lays a single egg, finally closing the opening, then passing on to other buds. The laying season lasts for two or three weeks, or, indeed, as long as the buds remain unexpanded; eggs are never laid in open blossoms. In warm weather, the eggs are hatched in six or seven days, usually about the end of April, into small, white, legless maggots, which feed upon the stamens and pistil; hence, although the petals are normally coloured, and expand, the flowers ultimately wither, and in some seasons very serious consequences have arisen from these injurious little pests. The maggot is fleshy, whitish, with a few hairs and a black, hard head; in a few days, it turns into a brown chrysalis or pupa, which, in turn, is changed into the Weevil, only about a month having elapsed from the deposition of the egg till the Weevil is developed. It feeds upon the foliage during summer, and hybernates in crannies of the bark, or under the soil at the base of the trees, during winter, waking up in the following spring to go through the same performances as its parents.

Remedies. Some of the methods advised for the extirpation of the American Blight will prove very useful for the destruction of this pest. Clear away all useless portions of the bark and rubbish round about the tree during the winter, and many will be destroyed. Place bandages of tarred cloth around the stem in spring; this will prevent the females crawling up, as they seldom fly. If a white cloth is placed beneath the tree affected when in bud, and the tree is severely shaken, a large number will be caught, as the Weevil falls to the ground when alarmed. Timely thinning of the trees, allowing the free admission of light and air, is also a very effectual preventive, as it has been proved that the greatest ravages are committed where neglect of this has been the rule; and that, on the other hand, in proportion to its being done, the pest has been lessened in numbers.

APPLE MUSSEL SCALE (*Aspidiotus conchiformis*). This insect attacks the bark of Apple and Pear-trees. It is in outward appearance like the half of a mussel shell. Under the scale is the insect. It is closely allied to the true scale insects, and has similar habits. The scales are about ⅛in. long, brown, and wider at one end than at the other. The female is like a fat, green, fleshy maggot, without jointed limbs. The eggs of this curious insect are not laid, but simply remain in the body of the mother until she dies, thus leaving a protecting shield or case from which the hatched larvæ emerge. To get rid of this insect, therefore, the females containing eggs should be destroyed. It differs from most other species in the absence of the long tail

Apple Mussel Scale—*continued.*

filaments. If numerous, this Scale causes the trees to become sickly and unfruitful. It is difficult to extirpate.

Soft-soap Lather. When the leaves fall, in autumn, the trees should be treated with a stiff sash-tool, and all the Scale rubbed off, keeping the brush just moist, and not rubbing the buds. Applied for two seasons, this should clear the trees. All loose bark should be removed.

Seal Oil is sometimes recommended as a good remedy; but oils are rather unsafe applications to the bark of trees, especially of the young branches.

APPLE OR CODLIN GRUB (*Carpocapsa pomonana*). During the month of May, the well-known Codlin Moth (see Fig. 127) lays its eggs in the calyces, usually

FIG. 127. CODLIN MOTH AND GRUB (CARPOCAPSA POMONANA).

one in each, of the young, quickly-growing apple. The moth itself is a small insect; the fore-wings are grey, prettily speckled with delicate, darker streaks, and with a curved golden mark on the hinder part, inclosing one of a reddish-brown colour. The hind wings are usually dark, as is also the body. The caterpillar, when hatched, is white, with black head and neck, and with four rows of black marks along the whole body. The colours soon, however, become less decided, taking an indistinct brownish or grey hue. After being hatched, the caterpillar gnaws its way down the fruit, keeping clear of the core, and gradually forces its gallery towards the rind of the fruit, which it finally pierces, the opening serving as the outlet for the dirt. When nearly full grown, it pierces the core and feeds upon the pips, which injury speedily causes the fruit to drop. The insect then emerges therefrom, and finds a suitable shelter in a cranny of the bark, where it spins a cocoon; and, according to British authorities, it remains in the larval state for some weeks, finally assuming the chrysalis form, and thus passing the winter; the moth emerges the following season. Shortly after development, the moths pair, the female depositing eggs in the fruit in June or July, according to the season.

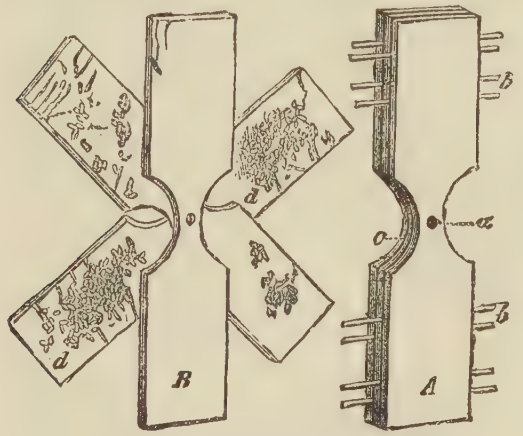
Practically, there is no preventive; but the following hints will serve to greatly reduce the numbers. All apples that fall ere they are ripe should be picked up as promptly as possible, and be given to the pigs; or pigs should be turned into the orchard to clear off the fallen fruit. The following is the only serviceable remedy:

Hayband Trap. This is simply a loosely made hayband twisted around the stems of the trees, about 1ft. from the ground. The grubs, in searching for a suitable place in which to make a cocoon, will generally choose the bands. At the end of the season, all the haybands should be collected and burnt, and the stems of the trees from which they were removed should be cleared of any cocoons which may adhere to them. All loose bark and other rubbish should be removed from the tree trunks, and also from the ground below.

APPLE OR CODLIN GRUB TRAP. An exceedingly ingenious and effective method of alluring that

Apple or Codlin Grub Trap—*continued.*

obnoxious pest, the Apple Grub. The trap (Fig. 128) consists of two, three, or more thin pieces of board, 12in. to 20in. in length, and 2in. to 4in. wide, with a screw (*a*)



B, OPEN. A, SHUT.

FIG. 128. APPLE OR CODLIN GRUB TRAP.

through their centre. The screw must be long enough to be firmly driven into the trunk of the tree, so as to hold the boards in position. Small slips of wood (*b*) are inserted between the boards, to keep them sufficiently open to allow of the entry of the grubs, as shown at *d*. The boards are cut on each side of the screw, as at *c*, to facilitate their separation when fastened together by the silken threads of the grubs, and to better expose the latter when the trap is opened. This handy trap, which is of American origin, is very cheap. A great number of them may be collected with little trouble, submitted to a killing heat, and replaced again; and they can be used either on the ground or on the trees. As regards killing the grubs when caught, Mr. Weir, the inventor, says: "The quickest and best way is to have a large tin pan, bent in on one side, so as to fit closely to the trunk of the tree. When you reach the tree, drop upon your knees, place the depression in the pan against the trunk of the tree, hold it there by pressing your body against it, and you have both hands free to open the trap. When opening it, many of the pupæ or chrysalids will fall into the pan. The trap must be turned clear around, as many will be found between it and the bark. A person will open and kill the worms in from four hundred to eight hundred traps in a day."

APPOSITE. Placed side by side.

APPROXIMATE, APPROXIMATED, APPROXIMATING. Near together.

APRICOT (*Armeniaca vulgaris*). The Apricot, or, as it was formerly written, "Abricock," is a much esteemed and luscious fruit. It is said to have been introduced into this country during the reign of Henry VIII. The Apricot is one of the earliest flowering of fruit-trees (see Fig. 129), and is generally in blossom during February. This fact is a great drawback, as it is a difficult matter to save the flowers from destruction by the spring winds and frosts. The fruit (see Fig. 130) contains less acid than most stone fruits, and in appearance it is perhaps the handsomest of all. Success with its culture in many gardens is by no means certain, but with careful preparation of borders and protection of the flowers in spring, satisfactory results are often obtained. Large quantities of fruit are annually imported to this country from France; but their quality and flavour cannot be compared with that of good home-grown produce.

Propagation is effected by seeds or budding. The stones, selected from the best varieties, may be sown as soon as the fruit is ripe, in August or September, in light rich soil, and

Apricot—*continued.*

covered with about 2in. of earth, over which a little litter should be spread during winter. After one season's growth, the plants should be lifted, and the tap roots slightly cut

FIG. 129. BLOSSOM OF APRICOT.

back if the trees are intended for walls. They should then be planted in nursery lines, allowing about a yard between the rows, and 2ft. from plant to plant.

FIG. 130. FRUITING BRANCH OF APRICOT.

Budding is the most general mode of propagating Apricots. They are frequently budded from the beginning to the middle of June on seedling, and also on plum stocks, of which latter the Mussell, Saint Julien, Brussels, and Black Damson are the best. For dwarf trees, the stock should be budded about 1ft. from the ground. There are many disadvantages in having a great length of stem. "Rider" trees require a stem from 3½ft. to 6ft.; half-riders, 2½ft. to 3ft. Grafting by the Whip method is sometimes employed, but, for many reasons, it is much inferior to Budding.

Planting, &c. South-west and western aspects suit the Apricot best, but the fruit has been ripened in warm localities on walls facing several points north. Large areas of garden wall (see Figs. 131 and 132), the walls of stables,

Apricot—*continued.*

barns, outbuildings, and two sides of at least hundreds of cottages, might thus be utilised for the cultivation of this tree. If well drained, almost any garden soil will bring these fruits to perfection; light, fibrous, rather sandy loam will, however, prove most satisfactory. There should be a considerable depth of soil; a yard is not too much, provided it be on a dry base, which is most important. Heavy soils may be improved for Apricot culture by the addition of an equal portion of light loam, mortar rubbish, or charred refuse. In furnishing walls, the distance apart

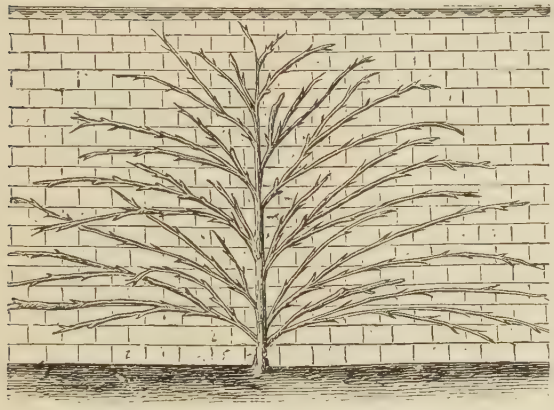


FIG. 131. APRICOT TREE, showing method of Wall Training.

may vary from 2ft. between Cordons, to 12ft., 15ft., or even 20ft. between Fan-shaped trees. The roots should be carefully arranged, interlayered at all points with fine soil, and the whole covered to a depth of 3in. or 4in. Not only should the roots have a good covering of suitable earth, but a secondary one of litter, or other light material, should be added, to render them frost proof in winter, and drought and heat proof in summer. Newly planted trees should, on no account, be allowed to get dry at the root. A thorough soaking of soft rain, or manure water, will often save a

FIG. 132. APRICOT TREE, showing method of Training suitable for Gable Ends of Cottages.

crop, and restore the trees, when all other surface remedies or appliances fail. Surface sprinklings overhead with the garden engine, in the afternoons of bright days, are beneficial, and help to keep the foliage clean and healthy. So soon as the trees are cleared of their fruit, attention should be directed to the maturation of the wood. All superfluous shoots should be removed, any excess of growth left on the shoots cut back, and every effort made to perfect the wood already made, rather than force the tree to make more. Unless the weather be very dry, water should not be applied after this stage.

Apricot—*continued.*

Protection. It is almost hopeless to expect a crop unless the blossoms are protected, by mats or other means, from spring frosts. Temporary wooden copings, from 1ft. to 2ft. wide, laid on iron brackets, are indispensable for warding off storms, and keeping other coverings away from the flowers. These should not be put up till the trees are just bursting into blossom, and may safely be removed about the end of May. A few fish or other nets, spread over the trees, afford considerable resistance to the radiation of heat. This is assuredly one of the easiest, if not one of the most efficient, modes of protection. Frigi-domo and other thick shadings are sometimes used, but they require to be removed from the trees in the day time. The thinner nets mentioned are generally not in use for other purposes at this time of year, and may remain over the trees altogether. Glass copings are the best, but, being rather expensive, they cannot be used by the majority of cultivators. They have, however, been applied with good results to trees that had previously failed.

Cropping, &c. Thinning of the fruit needs early and careful attention. The average of 3in. apart may be chosen for a maximum yield. As the fruits approach maturity, overhanging leaves, or branches of young wood, must be removed, to admit sun and light to properly ripen and colour them. Apricots for preserving should be gathered quite dry, and with the sun upon them. For dessert, they should be plucked in the morning, and placed in a cool room till wanted.

Under Glass. The Apricot will hardly bear forcing. It is more sensitive to heat than almost any other of our semi-hardy fruits. Practically, it is found that a confined atmosphere, or the slightest excess of heat, brings its blossoms off in showers, and this, of course, mars all prospect of fruit. But in cold climates and northern latitudes under glass is the best and only means of growing them. Should red-spider appear, it is proof that the roots or the atmosphere, probably both, have been too dry; more moisture, and syringing over the leaves, are the surest remedies. The borders need to be about 2ft. or 2ft. 6in. deep, of any light rich soil. Fresh planted trees should be frequently syringed overhead before and after the flowering period. After they have become fully established, less overhead sprinkling is needed. During all the earlier stages of growth, and until the fruits are stoned, an artificial temperature of 45deg. should not be exceeded. After that stage, the fruit will bear a heat of 50deg. or 55deg. It is hardly safe or desirable to exceed the latter under glass, and unless abundance of air is given, 55deg. may bring off the fruit, even at an advanced stage. A thorough soaking, at intervals of fourteen days during the height of the growing season, may be applied; and, should the trees be heavily cropped, manure water may be given at every alternate watering. It is also a good practice to mulch the surface of heavily cropped trees with 3in. or 4in. of good dung. The fruit should, however, be freely thinned to distances of from 4in. to 6in. apart at the most. There are three general methods of growing them under glass: The trees may be trained on trellises or walls; grown as natural standards, tall or dwarf; and as bushes, either planted out or in pots.

Varieties. The varieties of Apricot, unlike most other fruit, are not numerous; and the following will be found in every way representative and satisfactory:

Blanche, or **White Masculine.** A small and delicate fruited sort. Fruit pale whitish-yellow, tinged with brownish-red next the sun, covered with a fine white down; rich, delicate, and sugary.

Blenheim, or **Shipley's.*** Very early and prolific. Colour deep yellow; flesh medium, rich, and juicy. Ripe in July.

Breda.* A small sort, of excellent quality. Colour deep orange; flesh firm, juicy, and rich. Hardiest sort grown.

Kaisha.* Fruit round, much smaller than Moorpark. Colour pale citron; flesh tender, rich, juicy; flavour delicate and delicious; kernel very sweet.

Large Red. The deepest coloured of all. Fruit very large; colour deep reddish-orange; flesh rich and juicy; kernel bitter.

Apricot—*continued.*

Moorpark.* The sort most generally grown; large, handsome, and of excellent quality. Colour brownish-orange; flesh rich, juicy, and sweet. It is one of the best and most useful sorts in cultivation.

Peach, or **Grosse Peche.** Distinct and very desirable. Fruit very large; flesh rich, firm, and juicy. One of the very best.

Royal.* Not unlike Moorpark, but with a more robust constitution, and less given to limb dying. Fruit large, dull, yellow, rich, and juicy.

Turkey.* A good variety. Colour pale yellow; flavour rich and juicy; flesh firm.

For modes of Training and Budding, Diseases, Insect Pests, &c., full information will be found under each individual title.

APTERANTHES. *See* **Boucerosia.**

APTEROUS. Without wings.

AQUATIC PLANTS. The culture of Aquatic Plants, both indoors and in the open air, has been greatly neglected of late years; they are, therefore, rarely seen to perfection in places other than where their culture is made a speciality. Generally speaking, they are most easily grown. The following stove and greenhouse genera are well worth attention: *Aponogeton, Cyperus, Damasonium, Herpestis, Limnocharis, Nelumbium, Nymphœa, Ouvirandra, Pistia, Pontederia, Salvinia, Thalia, Trianea, Victoria.* Many species belonging to some of the foregoing genera are hardy, as are also the following: *Alisma, Butomus, Calla, Hottonia, Menyanthes, Nuphar, Polygonum, Sagittaria, Trapa, Typha, Villarsia.*

AQUATICUS. Living in water.

AQUATILIS. Living under water.

AQUIFOLIACEÆ. *See* **Ilicineæ.**

AQUILEGIA (from *aquila*, an eagle; in reference to the form of the petals). Columbine. ORD. *Ranunculaceæ.* Erect hardy perennial herbs with fibrous roots. Flowers solitary or panicled, drooping; sepals five, petaloid, deciduous; petals five, concave, spurred; spurs very large, produced downwards into hollow tubes, and frequently curved at the extremity; carpels five, sessile, free. Radical leaves on long stalks, twice or thrice ternate, with trifid-toothed, usually blunt segments. Too much praise can scarcely be lavished upon this elegant genus of plants. They prefer a moist and sheltered situation, with exposure to the sun. The more robust species will thrive in ordinary garden soil, but the rarer and more delicate kinds require a good friable sandy loam and leaf soil, with good drainage. Seed is produced in abundance, and must be sown very thinly, as soon as practicable after being ripe, in a shady place or in pans in a cold frame. When up, and strong enough to remove, the seedlings may be planted out where they are to flower, allowing every plant at least 9in. each way. The strong-growing kinds may be placed in the border, the dwarf ones on the rockery. When in blossom, the inferior sorts should be weeded out, retaining only the best varieties. To obtain seed true of any species, it is absolutely necessary to plant the separate kinds far apart, and cover them with fine muslin, to prevent the access of insects to the flowers, as none are more easily cross-fertilised. Division of the root is the only way to perpetuate any particular variety with certainty, unless seed is saved in the way mentioned, or imported from the native habitats of particular species. There are many beautiful hybrids, as well as species, in cultivation.

A. alpina (alpine).* *fl.* from 2in. to 3in. in diameter when expanded, deep blue or blue and white, on leafy, two to three-flowered stems; spurs straight, but somewhat incurved at the apex, one-half shorter than the petal limb. May. *l.* with segments deeply divided into linear lobes. *h.* 1ft. Alps of Switzerland, in shady humid places, 1731. Plant this on the rockery.

A. arctica (Arctic). A form of *A. formosa.*

A. atropurpurea (dark purple). *fl.* dark purple or bluish violet, about 1in. or 1½in. in diameter when expanded, two or three in a head; spurs straight, equal in length with the petals' limb; sepals about as long as the petals. May. *l.* petioled, biternate. *h.* 2ft. to 3ft. Siberia. Border plant.

Aquilegia—*continued.*

A. aurea (golden). A synonym of *A. chrysantha flavescens.*

A. Bertoloni (Bertoloni's).* *fl.* about 1in. across, blue-violet throughout; sepals about ¾in. long, rounded; petals about the same length; spurs very short, knobbed; stems two to four flowered. June and July. *l.* small, dark green, and glaucous. A very pretty little alpine, growing about 1ft. high. SYN. *A. Reuteri.*

FIG. 133. AQUILEGIA CÆRULEA.

A. cærulea (sky-blue).* *fl.* several on a stem, blue and white, sometimes more or less tinted with lilac or claret, rarely pure white, when expanded 2½in. to 3in. in diameter; spur very slender, nearly straight, green tipped, about 2in. long. April to July. *l.* large, biternate. *h.* 9in. to 15in. Rocky Mountains, 1864. A very lovely species for the border or base of the rockery. SYNS. *A. leptoceras, A. macrantha.* See Fig. 133.

A. c. alba (white).* *fl.* the same size and form as the type, white throughout. Rocky Mountains. A very rare and lovely variety; sometimes met with under the name of *A. grandiflora.*

A. c. hybrida (hybrid).* *fl.* blue and white, not so wide across as the type, but more numerous, and the plant has a much more vigorous habit. Of garden origin.

A. californica (Californian). A form of *A. formosa.*

FIG. 134. AQUILEGIA CANADENSIS, showing Habit and Flower.

A. canadensis (Canadian).* *fl.* scarlet, mixed with yellow, less than 1in. in diameter; spur straight, longer than the limb; styles and stamens protruding; sepals acutish, a little longer than the petals' limb. April to June. *l.*, segments three-parted, bluntish, and deeply toothed at the apex. *h.* 1ft. to 2ft. North America, 1640. Border or rockery; very pretty. See Fig. 134.

A. chrysantha (yellow-flowered).* *fl.*, sepals primrose yellow, spreading horizontally in full expansion, nearly or quite 1in. long,

Aquilegia—*continued.*

tinted claret at the tip; limb of petals deeper yellow, not quite so long; spur straight, very slender, divergent, 1½in. to 2in. long; stems many-flowered. May to August. *l.* biternate. *h.* 3ft. to 4ft. California, 1873. One of the finest of all hardy perennials for the border.

A. c. flavescens (yellow).* *fl.* of a uniform bright canary yellow, tinged with red; spur somewhat shorter than in *A. canadensis*, and slightly incurved. California, 1872. SYN. *A. aurea.*

FIG. 135. AQUILEGIA GLANDULOSA.

A. eximia (choice). Synonymous with *A. formosa.*

A. formosa (handsome).* *fl.*, sepals bright red, usually less than 1in. long, with an obtuse green tip; limb of petals yellow, about half as long as the sepals; spurs ⅛in. to ¾in. long, slender in the lower half, nearly straight, distinctly knobbed at the tip; stems many-flowered. May to September. *l.* biternate. *h.* 2ft. to 4ft. North America. Border. The following are synonyms and varieties: *A. arctica*, *A. californica*, *A. eximia*, and *A. f. truncata*, revealing only trivial differences. There is a very

Aquilegia—*continued.*

beautiful hybrid known in gardens as *A. californica hybrida*, with the sepals and petals yellowish, or tinged with orange, while the long slender spurs are orange red; it is one of the handsomest of all. All the forms are very showy, and well worth growing.

A. fragrans (fragrant).* *fl.* white or pale claret purple, finely pubescent, very fragrant; sepals about 1½in. long, not reflexing, twice longer than the broad petals' limb; spur slender, slightly curved, knobbed at the top, same length as the petals; stems few-flowered May to July. *l.* biternate. *h.* 1½ft. to 2ft. Himalayas, 1839. This requires a warm position.

A. glandulosa (glandular).* *fl.*, sepals bright lilac blue, about 1½in. long, more than twice the length of the petals' limb; petals white; spur ½in. long, or but little more, stout, much incurved; stems one to three-flowered. Spring. *l.* biternate. *h.* 8in. to 12in. Siberia, 1822. Extremely pretty. See Fig. 135.

A. g. jucunda (pleasant). *fl.* rather smaller. Very handsome little plants, freely hybridised, and it is necessary to keep raising fresh batches, as they are scarcely more than biennial.

A. glauca (glaucous). *fl.* white, tinted claret, fragrant; sepals 1in. long, not reflexing; limb of petals ⅔in. long; spur straight, or a little curved, about ½in. long; stem three to four-flowered. June. *l.* biternate. *h.* 1ft. to 1½ft. Himalayas, 1839. Rather tender; plant in a warm dry position.

A. leptoceras (slender-horned). A synonym of *A. cærulea.*

A. macrantha (large-flowered). A synonym of *A. cærulea.*

A. olympica (Olympic).* *fl.* large; sepals delicate mauve blue; petals white, rather shorter than the sepals; spur stout, short, obtuse. *l.* bi- or triternate, glaucous. *h.* 1½ft. 1880. Mount Olympus. See Fig. 136.

A. pyrenaica (Pyrenean).* *fl.*, sepals bright lilac blue, about 1in. long, but not quite as much broad; limb of petals about ½in. long, and half as broad; spur slender, nearly straight, or rather incurved, nearly or quite ¾in. long, scarcely knobbed at the end; stem one to three-flowered, with small and little compound deep green leaves. Summer. *h.* 9in. to 12in. Pyrenees, 1818. Plant on the rockery.

A. Reuteri (Reuter's). Synonymous with *A. Bertoloni.*

A. sibirica (Siberian).* *fl.* bright lilac; sepals very blunt, 1in. or a little more in length, spreading or slightly reflexing when fully expanded; limb of petals sometimes white, about ½in. long; spur stout, much incurved, ½in. to ¾in. long; stems many-flowered, glabrous. Summer. *l.* biternate. *h.* 1ft. Siberia, 1806. Rockery species. Here are referred, by Mr. Baker, *A. bicolor*, *A. Garnieriana*, and *A. speciosa.* See Fig. 137.

A. thalictrifolia (Thalictrum-leaved). *fl.*, sepals oblong, acute, lilac blue, about ½in. long; limb of petals about as long, and rounded at the top; spurs slender, not quite as long as the sepals; stems about three-flowered. Summer. *l.* with three-stalked segments cut into deep oblong lobes. *h.* 2ft. Tyrol, 1879. Entire plant clothed with fine pubescence.

A. viridiflora (green-flowered). *fl.*, sepals oval-oblong, shorter than the petals; spurs straight and longer than the petals; stems two to three-flowered. *h.* 1ft. to 1½ft. Siberia, 1780. Border. Rather a pleasing and sweet-scented green-flowered species, but not very ornamental.

A. vulgaris (common).* Common Columbine. *fl.* variously coloured; sepals ovate acute, about 1in. long, and half as broad; limb of the petal rarely exceeding ¾in. long, and half as much broad, rounded at the apex; spur much incurved, stout, knobbed at the end, as long as the petals; stems many-flowered. Spring and early summer. *l.* biternate. England, &c. There are numerous varieties of this very handsome species, both double and single-flowered.

A. v. alba (white). *fl.* pure white.

A. v. a. fl.-pl. Double white flowers.

A. v. cærulea nana fl.-pl. Very dwarf, with double deep blue flowers.

A. v. hybrida (hybrid). *fl.*, sepals lilac purple, oblong-lanceolate, less than 1in. long; limb of the petals white, about ½in. long; spur scarcely incurved.

A. v. Verveneana. This variety has pretty yellow mottled foliage.

Aquilegia—*continued.*

FIG. 136. AQUILEGIA OLYMPICA, showing Habit and Flower.

FIG. 137. AQUILEGIA SIBIRICA FLORE-PLENO, showing Habit and Flower.

A. v. Wittmanniana (Wittmann's). *fl.* large, bright lilac purple; sepals ovate-acute, 1in. to 1¼in. long, more than half as much broad; limb of petals white, about half the length of sepals; spur curved. A very fine variety.

The following names are also met with in gardens, some of which represent specific forms, but none are effective as garden ornaments: *advena, Burgeriana, Haylodgensis* (hybrid), *grata, longissima, nevadensis, oxysepala,* &c.

AQUOSUS. Watery.

ARABIS (origin of the word not clear). Wall Cress; Rock Cress. ORD. *Cruciferæ.* Hardy perennial trailers, except where otherwise stated. Flowers mostly white; racemes terminal; pedicels bractless. Radical leaves usually stalked; cauline ones sessile or stem-clasping, entire or toothed, rarely lobed. Most members of this genus are peculiarly well adapted for rockwork and the alpine garden, both from their natural hardihood as well as their early and profuse flowering habits. They are of the easiest possible culture in any dry soil. The perennial species may either

Arabis—*continued.*

be increased by divisions of the root, by cuttings, placed in a shady border during the summer, or by seed. The latter may be sown outside, or in pans, in spring, when most of them will germinate in two or three weeks. The annuals and biennials are for the most part devoid of any cultural beauty.

A. albida (whitish).* *fl.* white; racemes terminal; pedicels longer than the calyx. January to May. *l.* few-toothed, hoary, or downy with branched hairs; radical ones obovate-oblong; cauline ones cordately sagittate, clasping the stem. *h.* 6in. to 9in. Tauria and Caucasus, 1798. SYN. *A. caucasica.*

A. a. variegata (variegated).* A very pretty variegated form for edgings.

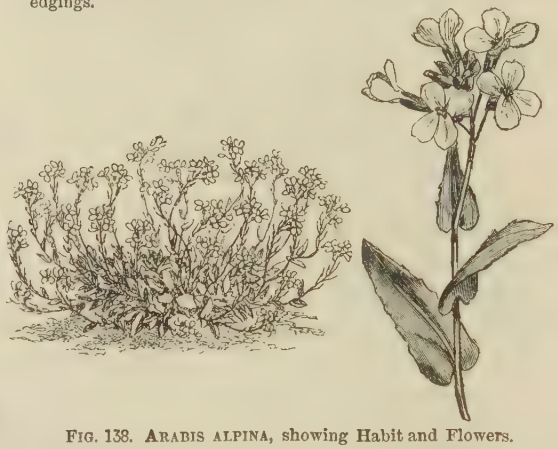


FIG. 138. ARABIS ALPINA, showing Habit and Flowers.

A. alpina (alpine).* *fl.* white, smaller than those of *A. albida*; racemes terminal; pedicels longer than the calyx, which is smoothish. March to May. *l.* many-toothed, lanceolate, acute, villous with branched hairs; radical ones somewhat stalked; cauline ones cordate, clasping the stem. *h.* 6in. European rocks, in sunny places, 1596. There are one or two varieties, including a variegated-leaved form, in cultivation. See Fig. 138.

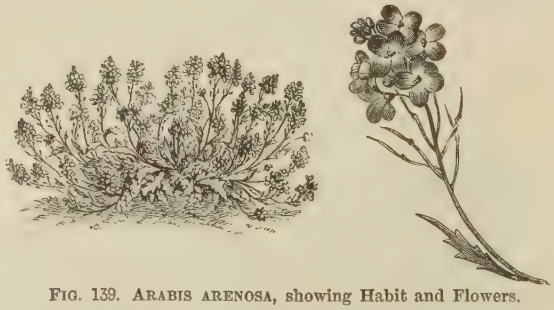


FIG. 139. ARABIS ARENOSA, showing Habit and Flowers.

A. arenosa (sand-loving).* *fl.* rose coloured, very rarely white or bluish; petals obovate; pedicels spreading. April to July. *l.* villous, with forked hairs; radical ones pinnatifid, with the upper lobes much larger than the lower; cauline ones deeply toothed. Stem branched, hispid, with simple hairs. *h.* 6in. Middle Europe, 1798. See Fig. 139.

A. blepharophylla (fringed-leaved).* *fl.* rosy purple; petals roundish, narrowing to the base, with slender claws. Spring. *l.* naked, except the margins, which are fringed with very stiff hairs; radical ones spathulate; cauline ones oblong, sessile, *h.* 3in. to 4in. California, 1874. This succeeds best in a cool frame, where it will flower in January.

A. caucasica (Caucasus). A synonym of *A. albida.*

A. lucida (shining).* *fl.* white; petals entire, narrowed at the base, twice as long as the calyx. Summer. *l.* obovate, thickish, shining, clasping the stem. *h.* 4in. to 6in. Hungary, 1790. A very pretty species, with a dwarf habit; it is especially adapted for edgings, borders, or rockwork.

A. l. variegata (variegated).* A great improvement upon the type, being broadly edged with yellow, and the green somewhat lighter. When grown in tufts or as edging, it is very effective, and should be prevented from flowering. This exceedingly desirable variety is a gem for the rockwork, and when seen in crevices, or in bold tufts, it is very striking. It must be increased by slips or rootlets, which should be taken in early summer.

Arabis—*continued.*

A. mollis (soft). *fl.* white, in terminal racemes. May to July. *l.* grossly toothed, somewhat pubescent, with small stellate hairs; lower ones on long petioles, cordate-roundish; cauline ones ovate-cordate, clasping the stem. *h.* 2ft. Caucasus, 1823.

A. petræa (rock).* *fl.* white; petals ovate, with stalks. June. *l.* smooth, ciliated or scabrous, with simple or bifid radical ones on longish stalks, entire, toothed; cauline ones oblong-linear, entire, or toothed. *h.* 3in. or 4in. Britain.

A. præcox (early). *fl.* white; petals obovately cuneated, double the length of the calyx. April to June. *l.* oblong, acute, sessile, quite entire, smooth. Stem covered with close pressed rigid hairs. *h.* 6in. to 9in. Hungary.

A. procurrens (procurrent). *fl.* white; petals obovate, double the length of the calyx. May and June. *l.* ovate, quite entire, smooth, ciliated with two-parted hairs; radical ones narrowed into a petiole; cauline ones sessile, pointed. Stolons creeping. *h.* 9in. Servia, 1819. There is a brilliantly variegated form of this pretty species well worth growing.

A. rosea (rosy).* *fl.* rosy purple; petals oblong, somewhat wedge-shaped, double the length of the calyx; pedicels longer than the calyx. May to July. *l.*, cauline ones oblong, somewhat cordate, and rather stem-clasping, scabrous with branched hairs. *h.* 1ft. Calabria, 1832.

A. verna (spring). *fl.* small, purple, with a white claw; pedicels shorter than the calyx. May to June. *l.*, cauline ones cordate, clasping the stem, toothed, scabrous with three-parted hairs. *h.* 3in. to 6in. South Europe, 1710. The best annual species.

ARACEÆ or **AROIDEÆ**. An extensive order of herbaceous plants, with tuberous rhizomes. Flowers on a spadix, unisexual or hermaphrodite, protected by a spathe. Leaves large, radical. Well known genera belonging to this order are: *Alocasia*, *Arum*, *Caladium*, *Colocasia*, and *Dieffenbachia*.

ARACHIS (from *a*, without, and *rachis*, a branch; plant branchless). Ground or Earth Nut. Ord. *Leguminosæ*. A stove annual, of economical value. Corolla resupinate; calyx a long tube, with a bilabiate limb; ovary stipitate, inclosed in the tube of the calyx; the stipe at first short, but afterwards becoming elongated. Sandy loam is the soil most suitable for their cultivation. Seeds should be sown in heat; and, when the plants have grown to a sufficient size, they should be potted off singly, and placed among other stove annuals. After the plant has finished flowering, and the pods begin to lengthen, the pedicels force them into the earth, where they ripen their seeds.

A. hypogæa (underground). Monkey Nut. *fl.* yellow, five to seven together in the axils of the leaves. May. *l.* abruptly-pinnate, bearing two pairs of leaflets, without any tendril; stipulas elongated, adnate to the petioles. *h.* 1ft., or procumbent. South America, 1812. See Fig. 140.

ARACHNIMORPHA. A synonym of **Rondeletia** (which *see*).

ARACHNOID. Resembling a cobweb in appearance; seeming to be covered with cobweb, in consequence of the entanglement of long, white hairs.

ARALIA (meaning unknown). Ord. *Araliaceæ*. This widely-grown genus includes stove, greenhouse, and hardy, herbaceous and shrubby plants. Flowers inconspicuous, umbellate, the umbels usually disposed in panicles; petals five, inserted on the margin of the disk; stamens five (see Fig. 142). Leaves usually compound. These plants are of moderately free growth, and the majority are easy to manage. Those requiring indoor treatment thrive well under the ordinary routine of management. One most important requirement, however, is that they must be kept well supplied with water at the roots. The finer, or stove varieties, should be potted in a mixture of sandy loam and peat, with the addition of a little fibrous leaf soil, and sufficient sand to keep the whole porous. The stronger growing kinds thrive in a richer compost. Propagation by cuttings of the roots is a common and very successful method. To obtain the roots, one of the strongest plants should be turned out of the pot, and the roots should be cleared of soil by shaking or washing it out; the requisite number of pieces should then be selected. As each piece is removed, it should have the end nearest the stem cut horizontally, to distinguish it from the other or furthermost end. In planting cuttings of the roots, it is best to place the end nearest the stem uppermost. The pieces may be left about 2in. long, and should be

Aralia—*continued.*

FIG. 140. ARACHIS HYPOGÆA, showing Leaf, Flower, &c., and Cluster of short wrinkled Pods.

inserted in pots, well drained, and filled with sandy soil, leaving the tops of the cuttings about level with the surface of the soil. A square of glass must be placed over the top of each pot, plunging them in moderate bottom heat. The stems of the plants from which the roots have been taken may be cut into pieces 1in. or 1½in. long, leaving an eye or bud near the top; a slice of half the shoot may be taken off opposite the bud. When prepared, these pieces should be pressed into pots of sand or sandy soil, and plunged into bottom heat. The stems may be cut down without disturbing the roots; in that case, if the pots are plunged in bottom heat, and kept moderately supplied with water, they will probably throw up several suckers or shoots from the roots. These, if taken off with a portion of root to each, and placed in small sized pots, will, with a little care, soon make useful plants. All the hardy species and most of the greenhouse ones are propagated readily by

Aralia—*continued.*

cuttings or pieces of roots. Some of the stove species, however, are very difficult to increase, except by grafting. Among these are *A. leptophylla*, *A. Veitchii*, &c. These should be worked on stocks of *A. Guilfoylei* or *A. reticulata*, the latter being the better of the two. Cuttings of either of these strike readily, and stocks fit for grafting are easily procured. In sheltered and warm positions, the greenhouse species are admirably suited for subtropical gardening, either planted singly or in groups. *See* also **Dimorphanthus, Fatsia, Hedera, Heptapleurum, Monopanax, Oreopanax, Panax,** and **Pseudopanax.**

A. canescens (greyish). A garden synonym of *A. chinensis.*

A. Chabrierii (Chabrier's).* *l.* alternate, pinnate, about a foot long; pinnæ opposite, 6in. to 9in. long, linear-lanceolate, deep green, with a heavy crimson midrib. 1882. Suitable for table decoration. A charming stove species.

FIG. 141. ARALIA CHINENSIS.

A. chinensis (Chinese).* *fl.* white; panicles terminal; peduncles umbelliferous. *l.* petiolate, coriaceous, woolly on both surfaces when young (only); pinnæ seven, ovate, serrated at the apex, erect and distinct. *h.* 5ft. to 6ft. 1838. This species, if planted in a soil with a dry porous bottom, will prove to be hardy. SYN. *A. canescens*, of gardens. See Fig. 141.

A. concinna (neat). *l.* unequally pinnate; pinnæ lobed and serrate. Stem spotted. New Caledonia, 1879. A handsome stove species, but very rare. SYNS. *A. spectabilis, Delarbrea spectabilis.*

A. crassifolia (thick-leaved). A synonym of *Pseudopanax crassifolium.*

A. edulis (edible).* *fl.* numerous, white; umbels globose, axillary and terminal, united into simple or compound racemes. Summer. *l.*, lower ones pinnate, with five leaflets, or three pinnate, with divisions of three to five leaflets; upper ones generally simple, with stalked leaflets, having a cordate base, ovate, acute, finely toothed, downy. *h.* 4ft. to 6ft. Japan, 1843. Hardy, herbaceous, perennial, hairy, and spineless.

A. elegantissima (most elegant).* *l.* digitate, on long dark green footstalks, which are mottled with white; leaflets seven to ten, filiform, and, being pendulous, impart a very graceful character to the plant. Stem straight, erect. South Sea Islands, 1873. Stove species, excellent for table decoration.

A. filicifolia (fern-leaved).* *l.*, leafstalks sheathing at the base, and terete in the upper part, expanding into a broad leafy limb which is impari-pinnately divided; pinnæ opposite, deeply pinnatifid, bright green, with a purplish midrib. Stem and leafstalks purplish, thickly marked with oblong white spots. Polynesia, 1876.

A. gracillima (most graceful). Synonymous with *A. Veitchii gracillima.*

A. Guilfoylei (Guilfoyle's).* *l.* pinnate, on long smooth terete petioles; leaflets oblong-elliptic, bluntish, from three to seven,

Aralia—*continued.*

they are sometimes obscurely lobed, and irregularly spinose, serrate, varying in size from 2in. to 3in. long, neatly and evenly margined with creamy white, the surface being in addition occasionally splashed with grey. Stem erect, copiously dotted with lenticular markings. South Sea Islands, 1876. Stove species.

A. heteromorpha (many-formed).* *l.* sometimes ovate-lanceolate and serrated, and at others bifid or even trifid at the apex, about 6in. to 8in. or 9in. long, bright shining green. A very desirable species, of robust and compact habit.

A. japonica (Japanese). Another name for *Fatsia japonica.*

A. Kerchoveana (Count Kerchove's). *l.* digitate, almost circular in outline; leaflets nine to eleven, spreading, elliptic-lanceolate, conspicuously serrated or undulated margins, of a deep glossy green relieved by a pale midrib. 1883. A very elegant slender-stemmed plant from the South Sea Islands, and likely to prove valuable for decorative purposes. Stove species.

A. leptophylla (slender-leaved).* *l.* compound, bearing often seven or more petiolate leaflets of a somewhat pendent character, and dark green in colour. 1862. An elegant stove or greenhouse slender growing species.

A. longipes (long-stalked). *l.* digitate, long stalked, and rather distant; leaflets oblanceolate acuminate, slightly undulated at the edge; petioles elongated. Stems simple. North Australia, 1882. A very distinct erect-growing evergreen stove species.

A. maculata (spotted). *l.* of a light green colour; leaflets oblong-acuminate, in about four pairs. Stem erect, which, as well as the stalks of the leaves, is of a blackish-purple hue, thickly spotted with green dots. This peculiar colouring is very distinct and conspicuous. South Pacific Islands. Stove species.

A. Maximowiczii (Maximowicz's).* *l.* on long stalks, palmately five to seven-lobed; lobes lanceolate, 3½in. long, serrate. Japan, 1874. An elegant and distinct hardy shrub, with erect spiny stem. SYN. *Acanthopanax ricinifolium.*

A. monstrosa (monstrous).* *l.* pendent, pinnate; leaflets three to seven, oblong elliptic, deeply and irregularly serrated (this serration sometimes takes most fantastic forms), broadly margined with creamy white, the surface blotched with grey. South Sea Islands, 1880. Stove species.

A. nudicaulis (naked-stemmed).* *fl.* greenish; scape trifid at the apex, shorter than the leaf, each division bearing a many-flowered umbel. June. *l.* radical, the divisions pinnately five foliate; leaflets oblong-oval, with a long tapering point, serrate. Root horizontal, very long. *h.* 3ft. to 4ft. North America, 1731. Quite hardy, herbaceous perennial.

A. Osyana (Osyan).* Resembling *A. leptophylla*, but with leaflets deeply bifid at the ends; surface colour bright green; primary veins and tips of the leaflets chocolate brown. South Sea Islands, 1870. Very elegant stove species.

A. pentaphylla (five-leaved).* *l.* digitate, or sometimes only three leaflets are produced, each varying from 6in. to 10in. in length, and from 1in. to 2in. in breadth, deeply lobed or pinnatifid, bright shining green. Stem arboreous, prickly. *h.* 20ft. Japan. SYN. *Panax spinosa.*

A. p. variegata (variegated). *l.* broadly edged with creamy white. Japan, 1874.

A. quercifolia (Oak-leaved).* *l.* opposite, trifoliolate; leaflets deeply sinuate; lower petioles about 3in. long, light shining green. New Britain, 1880. Very pretty stove species.

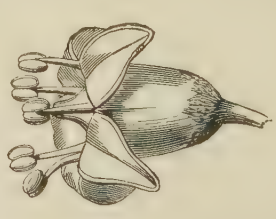


FIG. 142. FLOWER OF ARALIA RACEMOSA, enlarged.

A. racemosa (raceme-flowering).* *fl.* greenish-white, petals spreading; peduncles axillary, disposed in a terminal raceme, umbelliferous. June. *l.* petioles tripartite, the partitions bearing each three to five ovate or cordate, acuminated, serrated, smoothish leaflets. *h.* 3ft. to 4ft. North America, 1658. Hardy herbaceous species, highly ornamental. See Fig. 142.

A. reticulata (netted). *l.* alternate, strap-shaped when young, becoming larger with age, dark green, reticulated with a lighter shade of the same colour. A very handsome species, requiring stove heat during winter. In spring and summer it is admirably suited for conservatory or indoor decoration, having a light and graceful aspect.

A. rotunda (round). *l.* sometimes of a single leaflet only, which is spreading, orbicular, cordate at the base, margined with distinct white tipped teeth; at other times, especially when

Aralia—*continued.*

approaching maturity, the leaves are trifoliate, the leaflets being rounded and toothed, and the terminal one being about double the size of the lateral ones. Stems erect, brownish-green, spotted when young with pale elongate blotches. Polynesia, 1882.

A. Scheffleri (Scheffler's). *l.* on long petioles, digitate; leaflets five, petiolulate, lanceolate, attenuated at the base, serrulated, glabrous on both surfaces. Stem shrubby, smooth. New Zealand. Greenhouse species.

A. spectabilis (showy). A synonym of *A. concinna.*

A. spinosa (thorny).* Angelica Tree. *l.* doubly and triply pinnate; leaflets ovate, acuminated, deeply serrated. Stem simple, prickly (as are also the petioles), forming into an umbrella-like head, deciduous. *h.* 8ft. to 12ft. North America, 1688. A very fine hardy species for sheltered spots.

A. spinulosa (small-spined). *l.* alternate, pinnate; pinnæ ovate acuminate, dark green, margined with little reddish-crimson spines or prickles. Stems and petioles spotted and suffused with crimson. 1880. A bold and robust stove plant.

A. ternata (three-leafleted).* *l.* opposite, ternate; leaflets oblong-lanceolate; margins in some cases deeply serrate, in others sinuate, light green. New Britain, 1879. A slender growing species.

A. trifolia (three-leaved). A synonym of *Pseudopanax Lessonii.*

A. Veitchii (Veitch's).* *l.* digitate, with about eleven filiform undulated leaflets, glossy green above, dark red beneath; petioles long and slender. New Caledonia, 1867. A very handsome (said to be the best) species, with slender, erect growing stem. See Fig. 143, for which we are indebted to Messrs. Veitch and Sons.

Aralia—*continued.*

A. V. gracillima (most graceful).* *l.* alternate, spreading; leaflets nearly linear, but slightly narrowed at both ends, having a prominent ivory-white central rib. South Sea Islands, 1876. An erect growing species, with an elegantly graceful habit. It is allied to *A. reticulata*, but is more handsome. This charming variety is undoubtedly the finest for table decoration, and is frequently grafted upon stocks of the typical form. It enjoys plenty of heat. SYN. *A. gracillima.*

ARALIACEÆ. An order of trees, shrubs, or (rarely) herbaceous plants, often pubescent, and sometimes spiny. Flowers variously disposed, hermaphrodite or unisexual, regular; petals usually five, and valvate. Leaves alternate, or (rarely) opposite. This order is closely allied to *Umbelliferæ*; and the best known genera are *Aralia* and *Hedera.*

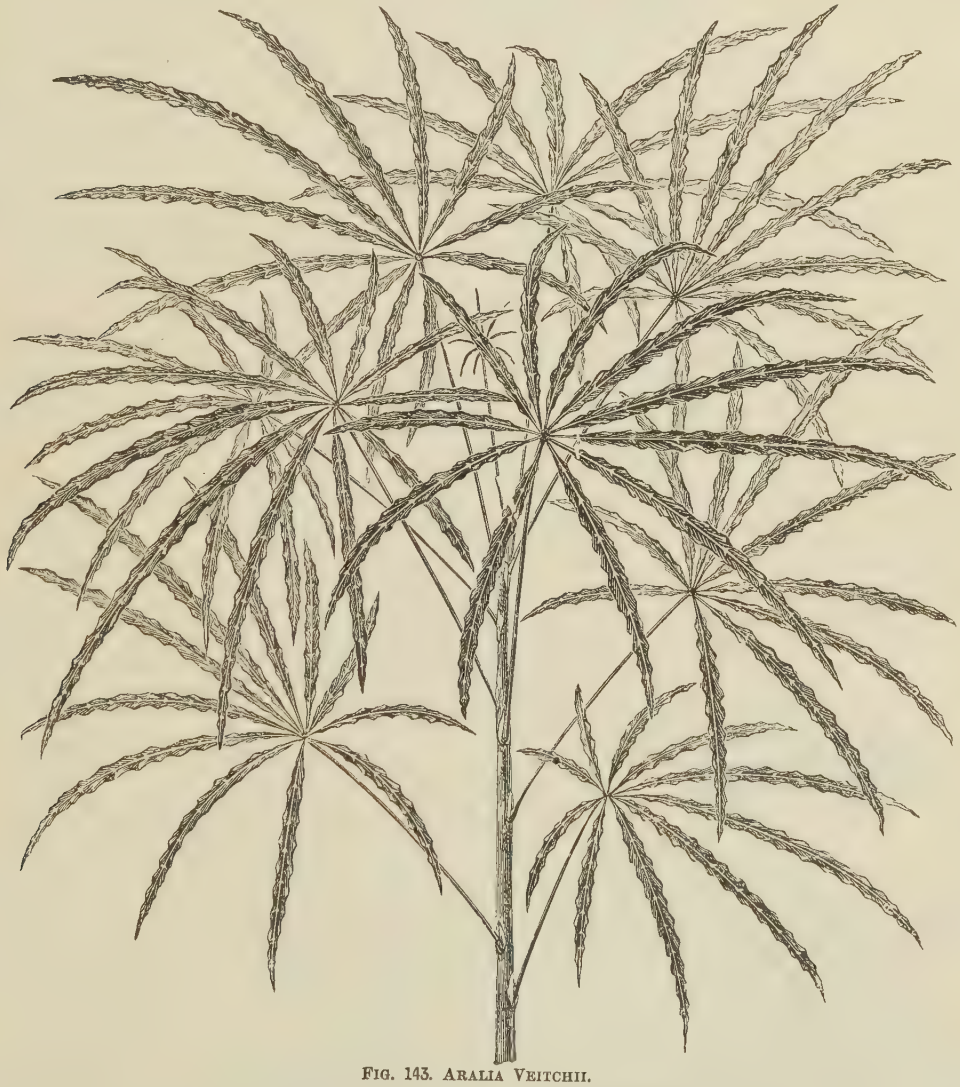


FIG. 143. ARALIA VEITCHII.

ARAR-TREE. A common name for **Callitris quadrivalvis** (which *see*).

ARAUCARIA (from *Araucanos*, its name in Chili). SYN. *Eutacta.* ORD. *Coniferæ.* A noble genus of dicœcious or sub-dicœcious evergreen trees, with usually imbricated persistent flat sessile scale-like leaves. Male cones large, cylindrical, terminal; female ones very large, globular, terminal, with dense ligneous deciduous scales, each bearing a solitary seed. The majority of the species are not, unfortunately, sufficiently hardy to withstand our

Araucaria—*continued.*

winters out of doors. Few trees can compete with them in symmetry and elegant proportion for conservatory decoration, where they may be grown in large tubs, or planted out. Small plants grown in pots are most serviceable for table and other decorative purposes. They thrive in a good fibrous loam, mixed with leaf soil and sand. Propagation by means of seed is the surest and most satisfactory method; the seed should be sown in pans or boxes, or if in large quantities, in a bed, with but gentle heat; they usually take some time to germinate. Cuttings are procured by taking off the leading shoots, and fixing them firmly in a pot of sand; they first require a cool place, but may afterwards be subjected to slight warmth. When rooted, they should be potted off into the soil above mentioned. The young growths which afterwards shoot from the plant, whence the cutting, may be taken off and treated in much the same manner. These are the only methods of propagation worth pursuing.

A. Balansæ (Balansa's). *male cones* cylindrical-conical, 2in. *female cones* elliptic globose, 4in.; scales obovate, cuneate. *l.* arcuately-uncinate, ovate triangular, imbricated round the distichous, simple branchlets. *h.* 130ft. to 160ft. New Caledonia, 1875. A fine greenhouse plumosely branched tree.

A. Bidwillii (Bidwill's).* Bunya-Bunya Pine; Moreton Bay Pine. *cones* sub-globose, longest diameter 10in. to 12in., shortest 9in. to 10in. *l.* ovate-lanceolate, in two nearly horizontal rows, acuminated, slightly convex above, concave beneath, leathery, deep shining green. *h.* 150ft. Moreton Bay. Habit very regular and symmetrical. Greenhouse species.

A. brasiliensis (Brazilian). *l.* oblong-lanceolate, much attenuated at the point, loosely imbricated, deep green; lower part of the trunk usually free from branches, terminating in a rounded head. *h.* 70ft. to 100ft. Brazil, 1819. *A. b. gracilis*, and *A. b. Ridolfiana* are two forms of this species.

A. columnaris (columnar). A synonym of *A. Cookii.*

A. Cookii (Cook's).* *l.* awl-shaped, short, densely imbricated around the frondose branches. Described by Mr. Abbay as having "a somewhat curious habit, even when growing alone, of shedding their branches for five-sixths or more of their height, and then replacing them by a smaller and more bushy growth, so that the tree at a distance presents a very columnar appearance, the resemblance being increased by the summit being crowned with a mass of foliage somewhat like a capital." *h.* 200ft. New Caledonia, 1851. SYN. *A. columnaris.*

FIG. 144. ARAUCARIA EXCELSA.

A. Cunninghami (Cunningham's).* *l.* on the sterile branches needle-shaped, obscurely quadrangular, rigid, acute; on the fertile branches shorter, stouter, closely appressed, bright green; upper

Araucaria—*continued.*

branches ascending, lower ones horizontal. *h.* 100ft. Moreton Bay. This fine species we have found to be quite hardy on the south-west coast of England.

A. C. glauca (milky-green). A very handsome variety, with silvery glaucous leaves.

A. excelsa (lofty).* The Norfolk Island Pine. *l.* awl-shaped, curved, sharply acuminated, bright green, densely packed on the frondose, deltoid, horizontal, or pendulous branches. When well grown, this is a beautifully symmetrical greenhouse or conservatory species, attaining to a height of 150ft., and a circumference of 20ft. or more. Norfolk Island. This is especially desirable in a small state. There are several varieties known, the best being: *A. e. glauca*, having lighter green, and very glaucous foliage; and *A. e. robusta*, which is larger in all its parts. See Fig. 144.

A. Goldieana (Goldie's).* Allied to *A. Rulei.* *l.* produced in whorls, pendulous, dark green, varying in size. New Caledonia Most distinct and elegant for conservatory decoration.

A. imbricata (imbricated).* The Monkey Puzzle. *fl.*, male and female catkins on separate trees; the males are six or seven in a cluster, pedunculate, yellow, and oval with numerous scales, imbricated, long, and recurved at the points; the female catkins are oval, with numerous wedge-shaped scales, with narrow oblong brittle points; they are produced at the ends of the branches. *cones*, when fully ripe globular, from 3in. to 4in. in diameter, dark brown. The branches are horizontal, inflexed, and ascending at the extremities, and are produced in whorls. *l.* ovate-lanceolate, sessile, thickened at the base, stiff, leathery, straight, somewhat keeled-shaped below, and strongly mucronate at the apex; verticillate, with seven or eight in a whorl, imbricate, and closely encircling the branches, concave, glabrous, shining, marked with longitudinal lines, dotted on both sides. *h.* 50ft. to 100ft. Chili, 1796. A well known hardy tree, of striking aspect, and indispensable to Arboreta and shrubberies. See Fig. 145.

A. Rulei (Rule's).* *male cones* oblong obtuse; *female cones* oval. *l.* oblong-lanceolate, with a prominent dorsal nerve, more closely appressed, and less sharply pointed than in the foregoing species; imbricated in four rows. Branches horizontal; branchlets often quite pendulous. *h.* 50ft. Papuan Archipelago.

A. R. elegans (elegant).* *l.* smaller; whorls of branches closer together; branchlets more slender. An elegant form; and, from its comparative dwarf and graceful habit, should be very generally grown.

ARBOR. A tree. A perennial plant, having a distinct bole or trunk, from which the main branches grow.

ARBORESCENT. Having a tendency to become a tree.

ARBORETUM. A collection of hardy trees formed for pleasure or instruction, and which, when well managed, is a source of much interesting study. They afford shelter, improve the local climate, renovate bad soils, &c., and also, by concealing or hiding disagreeable objects, heighten the effect of agreeable ones, create beauty, and add value. A properly arranged Arboretum should be constructed with a view to picturesque beauty, and not systematically, as is usually the case in Botanic Gardens, although scientific purposes are best served by a systematic arrangement.

ARBOR-VITÆ. *See* **Thuja.**

ARBOUR. A seat surrounded by lattice work, covered by Vines, Wistarias, or other climbing plants.

ARBUTUS (from *arboise*, Celtic for austere bush; in allusion to the austere quality of the fruit). Strawberry-tree. SYN. *Unedo.* ORD. *Ericaceæ.* A genus of very ornamental, evergreen trees and shrubs. Corolla globose or ovately campanulate; petals five, reflexed. Leaves alternate, Laurel-like. The species thrive in a light sandy or peaty soil. They may be propagated by seeds, which should be sown in sand during March; by budding, and by inarching; the first mentioned method is the one most generally employed, with good results. The various sorts may be grafted, budded, or inarched upon *A. Unedo.* The greenhouse species are rare in cultivation, but their management does not materially differ from other plants requiring a similar temperature.

A. Andrachne (Andrachne).* *fl.* greenish-white; panicles terminal, erect, clothed with viscid down. March and April. *l.* oblong, bluntish, entire in some, a little serrated in others, glabrous. *h.* 10ft. to 14ft. Greece, 1724. A fine ornamental tree.

A. A. serratifolia (saw-edge-leaved). *fl.* yellowish, disposed in rather large terminal clusters. *l.* serrated, and narrower than those of the species. SYN. *A. serratifolia.*

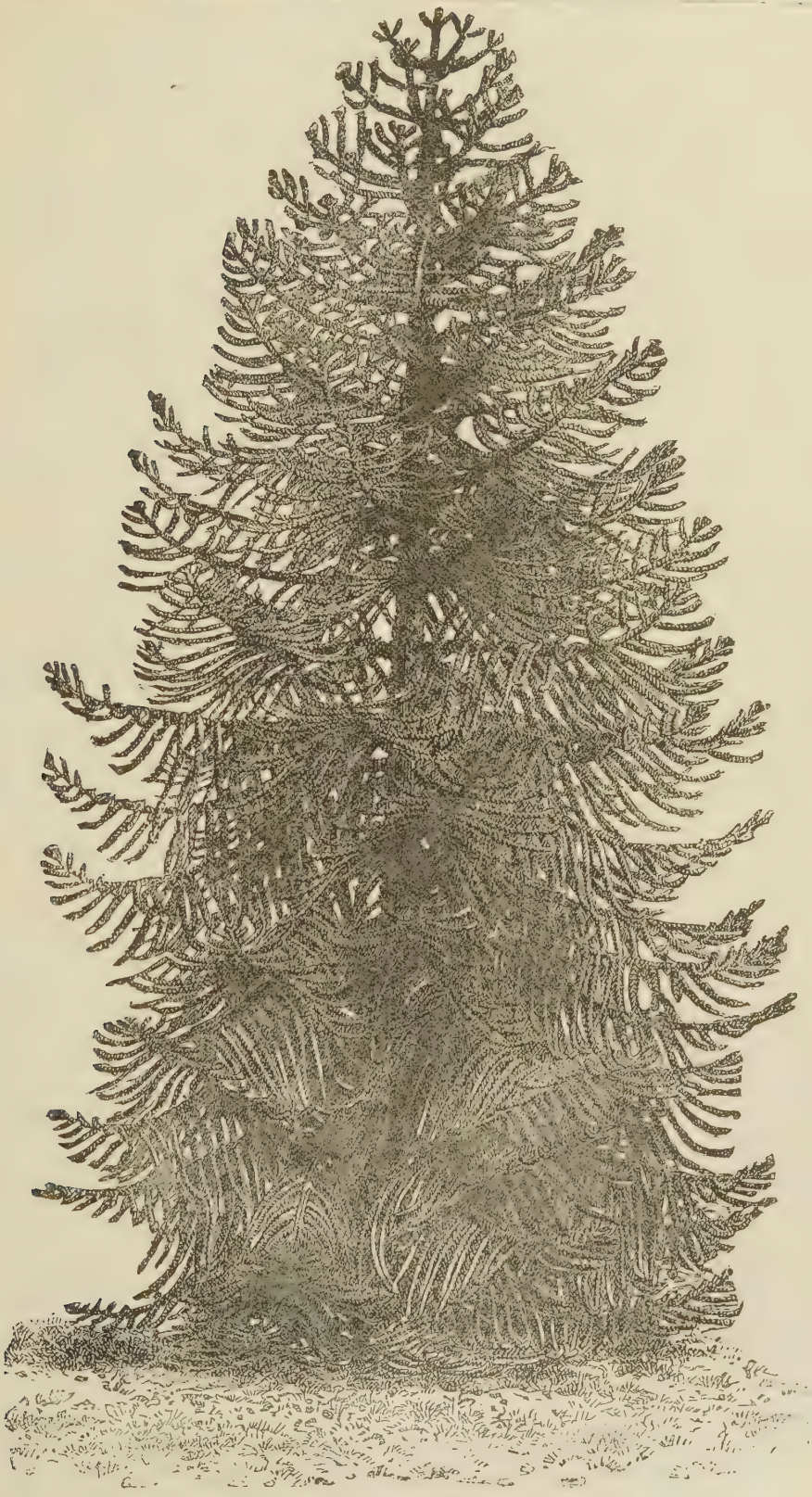


FIG. 145. ARAUCARIA IMBRICATA.

Arbutus—*continued.*

A. andrachnoides (Andrachne-like). A synonym of *A. hybrida.*

A. canariensis (Canary). *fl.* greenish-white; panicles erect, hispid. May. *l.* oblong-lanceolate, serrated, glaucous beneath. *h.* 8ft. to 10ft. Canary Islands, 1796. Greenhouse.

A. densiflora (thickly-flowered).* *fl.* white; corolla oval; pedicels furnished with three bracteas at the base; panicle terminal, composed of closely packed racemes. *l.* 4in. to 5in. long, on long petioles, oblong, acute, sharply toothed, coriaceous, glabrous above and shining, but downy beneath, the middle nerve with rusty villi; branches angular, hairy. *h.* 20ft. Mexico, 1825. Greenhouse.

A. hybrida (hybrid).* *fl.* white; panicle terminal, pendulous, downy. September to December. *l.* oblong, acute, serrated, glabrous; branches pilose. *h.* 10ft. to 0ft. A half-hardy garden hybrid; it originated about 1800. SYN. *A. andrachnoides.*

A. Menziesi (Menzies').* *fl.* white; racemes axillary and terminal, panicled, dense-flowered. September. *l.* broad-oval, quite entire, glabrous, on long petioles. *h.* 6ft. to 10ft. North-west America, 1827. A noble hardy tree. *A. laurifolia* comes close to this species. SYN. *A. procera.*

A. mollis (soft). *fl.* rosy, drooping; panicle terminal, crowded, racemose. June. *l.* oblong-acute, sharply toothed, coriaceous, clothed with soft pubescence above, and white tomentum beneath. *h.* 6ft. Mexico. Greenhouse shrub.

A. mucronata (mucronate). A synonym of *Pernettya mucronata.*

A. pilosa (pilose). A synonym of *Pernettya pilosa.*

A. procera (tall).* A synonym of *A. Menziesi.*

A. serratifolia (saw-edge-leaved). A synonym of *A. Andrachne serratifolia.*

A. Unedo (Unedo).* The Strawberry Tree. *fl.* white, deep red in some of the varieties, nodding, in terminal racemose, bracteate panicles. September. *fr.* large, scarlet, nearly globose, granular, edible. *l.* oblong-lanceolate, glabrous, serrulated; branchlets clothed with glandular hairs. *h.* 8ft. to 10ft. West of Ireland, and South Europe. There are several varieties of this plant in cultivation. It is one of the greatest ornaments in the months of October and November—the season when it is in flower, and when, also, the fruit of the former year is ripe.

A. Xalapensis (Xalapan). *fl.* reddish white; corolla ovate; panicle terminal, composed of many racemes. April. *l.* petiolate, oblong, acute, quite entire, about 2in. long, glabrous above, but clothed with brownish tomentum beneath; epidermis separating, brownish purple. Young branches glabrous, but beset with ramentæ. *h.* 6ft. to 9ft. Mexico. Greenhouse species.

ARCHEGONIUM. The female organ in ferns, &c., analogous with the ovary in flowering plants.

ARCTOSTAPHYLOS (from *arktos*, a bear, and *staphyle*, a grape; bears eat the fruit of some species). ORD. *Ericaceæ.* Handsome hardy or half-hardy shrubs or sub-shrubs, agreeing in generic characters with *Arbutus*, except that the fruit is five-celled and the cells one-seeded, and not granular on the outside. For culture, &c., *see* **Arbutus.**

A. alpina (alpine).* Black Bearberry. *fl.* white or flesh-coloured, in terminal, reflexed racemes; pedicels rather hairy. April. *l.* obovate, acute, wrinkled, serrated, deciduous. Stems procumbent, trailing. Scotland (but rare), &c. SYN. *Arbutus alpina.*

A. nitida (shining).* *fl.* white; racemes terminal. May. *l.* oblong-lanceolate, acute, smooth on both sides and shining above. *h.* 4ft. Mexico, 1839. An erect half-hardy evergreen.

A. pungens (stinging).* *fl.* white; pedicels close; racemes short, at first terminal, but at length lateral. February. *l.* ovate-oblong, acute, mucronate, rather pungent, quite entire, coriaceous, clothed with fine down on both surfaces; branchlets angular, downy. *h.* 1ft. Mexico, 1839. A dwarf, much branched, half-hardy evergreen shrub.

A. tomentosa (tomentose).* *fl.* pure white, campanulately urceolate, bracteate; peduncles axillary, shorter than the leaves, somewhat capitately racemose. December. *l.* oval, acute, sub-cordate at the base, clothed with white tomentum beneath, on short petioles; branches hispid. *h.* 4ft. North-west America, 1826. Shrubby species; hardy.

A. Uva-ursi.* Bearberry. *fl.* flesh-coloured, with a red mouth, growing in small clusters at the extremities of the branches. April. *l.* obovate, quite entire, coriaceous, shining. Highlands of Scotland and Wales. A hardy evergreen procumbent trailer. SYN. *Arbutus Uva-ursi.*

ARCTOTHECA (from *arktos*, a bear, and *theke*, a capsule; so named from the roughness of the fruit). ORD. *Compositæ.* Greenhouse herbaceous perennial, allied to *Arctotis.* Heads radiate; involucral scales imbricate in many rows, the outer linear, herbaceous, inner larger, scariose, very obtuse; receptacle honeycombed, bearing many little fringes; achenes ovate, somewhat four-sided, without wings or pappus. It thrives in a compost of peat, leaf soil, and loam. Propagated by divisions of the plant,

Arctotheca—*continued.*

or cuttings, in spring. Several species formerly classed in this genus are now included under *Arctotis.*

A. repens (creeping). *fl.-heads* yellow. July. *l.* petioled, lyrate-pinnatifid, green and mostly smooth above, white-woolly beneath. Cape of Good Hope, 1793. A stemless, creeping or decumbent herb.

ARCTOTIS (from *arktos*, a bear, and *ous*, an ear; in reference to the shaggy fruit). ORD. *Compositæ.* Mostly half-hardy herbaceous perennials. Involucral bracts numerous, imbricated, scariose on the margin; receptacle pitted, studded with bristles between the florets; achenes grooved, crowned with a pappus of membranous scales. The species of this genus are of easy culture in a compost of loam and leaf soil. Propagated by cuttings at any time of the year; these should be pricked in pots of very sandy soil, and placed in gentle warmth; they must be kept uncovered and moderately dry, or they will rot. The Arctotis are very handsome plants in sunny, dry positions outside during the summer months, but they must be protected during winter.

A. acaulis (stemless).* *fl.-heads* yellow and red. Summer. *l.* hoary on each side, ternate, lyrate. Stem very short, decumbent. *h.* 4in. Cape of Good Hope, 1759. Very rarely met with.

A. arborescens (tree-like).* *fl.-heads*, ray-florets white above, pink beneath; disk-florets yellow; disposed in large circular Daisy-like heads. Summer. *l.* linear-oblong, pinnate; upper ones amplexicaul; lower ones stalked. *h.* 2ft. Cape of Good Hope, 1815.

A. argentea (silvery). *fl.-heads* orange. August. *l.* lanceolate-linear, entire, downy. *h.* 1ft. Cape of Good Hope, 1774.

A. aureola (golden). Synonymous with *A. grandiflora.*

A. breviscapa (short-stalked). Synonymous with *A. speciosa.*

A. grandiflora (large-flowered).* *fl.-heads* orange; outer scales of involucre reflexed, cuneate, oblong, with a broad short point, somewhat cobwebbed. July. *l.* pinnatifid, serrulate, three-nerved. *h.* 1½ft. Cape of Good Hope, 1710. SYNS. *A. aureola* and *A. undulata.*

A. reptans (creeping). *fl.-heads* white, orange. July. *l.* hairy beneath; lower lyrate toothed; upper lanceolate toothed. Stem ascending. *h.* 8in. Cape of Good Hope, 1795.

A. rosea (rosy). *fl.-heads* pink. Autumn. *l.* spathulate-lanceolate, repand-toothed, hoary. Stem procumbent. Cape of Good Hope, 1793.

A. speciosa (showy).* *fl.-heads* yellow; outer scales of involucre linear recurved. July. *l.* lyrate, pinnatifid, hoary beneath, three-nerved. Plant stemless. *h.* 1½ft. Cape of Good Hope, 1812. Closely allied to *A. acaulis.* SYN. *A. breviscapa.*

A. undulata (wavy). Synonymous with *A. grandiflora.*

ARCUATE, ARCUATED. Curved or bent like a bow; forming an arch.

ARDISIA (from *ardis*, a point; in reference to the acute, spear-pointed anthers). SYN. *Pyrgus.* ORD. *Myrsineæ.* An extensive genus of greenhouse or stove, mostly ornamental, evergreen trees and shrubs. Flowers white or rose-coloured, more or less panicled; panicles sometimes many-flowered at the extremities of the branches, and longer than the leaves, sometimes few-flowered and in the axils of the leaves. Leaves alternate, rarely almost opposite, or three in a whorl, dotted. Propagated by cuttings of the half-ripened wood taken from the side shoots of the plant any time from March to September; but, as the points of these side shoots bear the blossoms and fruit, they are not well adapted for making good plants. To obtain the best plants, the largest, ripest, and best-coloured berries should be sown early in spring, as soon as gathered, in a wide-mouthed pot or seed pan, well drained and filled with loam and peat in equal parts, with the addition of some sand, and plunged in bottom heat, the soil being kept moderately moist. The seeds will germinate in a few weeks after sowing, and when about 2in. high, the strongest seedlings should be selected and placed in 3in. pots, the same mixture of soil being used, with the addition of a fourth part well decomposed manure. After potting, the plants must be moistened overhead twice a day with a fine rose or syringe, and be kept in a close atmosphere until the roots have taken to the fresh soil.

Ardisia—*continued.*

When the plants begin to grow again, they should be removed to a light situation in the house; and when the pots are well filled with roots, a shift into 6in. pots may be effected, water being given judiciously until well established, and here they may remain to fruit. Until the berries are coloured, clear manure water, given once or twice a week, will be found beneficial. The plants arrive at their best when about 18in. or 2ft. high; after that, they begin to get naked at the bottom. It will then be wise to cut the worst plants down to within 2in. of the pots, in early spring, allowing them to become dry at the roots before this operation is performed. By giving moisture to the roots when the cut has become dry, the plants will soon break into growth again, when some of the worst placed shoots should be rubbed off, leaving only one or two of the strongest and best placed, calculated to develop into a well formed plant. When the shoots have grown 2in. or 3in., the plants should be turned out of their pots, the soil shaken out from the roots, and the long ends of the roots trimmed in a little with a knife; they must then be placed in a pot sufficiently large to hold the roots without squeezing. The plants should now occupy the warmest end of the house in which they are grown, care being taken in watering until new roots are formed, when they may have more air and somewhat liberal supplies of water. As soon as they are sufficiently advanced in growth, they should be transferred to a larger-sized pot. With proper treatment, they will flower and fruit the same season as they are cut down, and form handsome plants. Although most species of this genus are classed as stove plants, they will succeed very well in a temperature that does not fall below 45deg. in winter; and, when so grown, they are not so liable to become infested with large brown scale and other insect pests. This is particularly the case with *A. crenulata*, and cool treatment is also favourable to the ripe berries hanging on the plants for a much longer time than when grown in a stove. Moreover, they do not suffer so much when removed for decorative purposes.

A. acuminata (taper-pointed). *fl.* nearly white; petals small, acute, dotted; panicles terminal and axillary, many-flowered. July. *l.* entire, glabrous, oblong, acuminated, attenuated at the base. *h.* 6ft. to 8ft. Guiana, 1803.

FIG. 146. FLOWERING BRANCH OF ARDISIA CRENULATA.

A. crenulata (round-notched-leaved).* *fl.* reddish violet; panicles terminal; pedicels umbellate. June. Berries numerous, bright coral-like. *l.* lanceolate-ovate, tapering at both ends, repandly crenulated, pilose. *h.* 3ft. to 6ft. Mexico, 1809. When grown in a cool atmosphere, as previously alluded to, it is quite common for one crop of berries to hang on the plants until another crop is ripe. This is a splendid plant, superior even to the red-berried Solanums for decorative purposes, for which it is largely grown. See Fig. 146.

Ardisia—*continued.*

A. crispa (curled). *fl.* small, drooping, red; cymes terminal, usually solitary, often compound; pedicels smooth, finely veined, umbellate, drooping. July. Berries red, size of peas. *l.* bluntish, oblong-lanceolate, attenuated at both ends, with repandly crenulated glandular edges, glabrous. *h.* 4ft. India, 1809.

A. humilis (humble). *fl.* rose-coloured; peduncles solitary, bearing each a simple racemose umbel of many pretty, large, drooping flowers; petals lanceolate, first recurved, afterwards revolute. June. Berries size of peas, shining, black, juicy. *l.* oblong-lanceolate, acuminated at both ends, glabrous, veined, shining. *h.* 4ft. India, 1820.

A. japonica (Japanese).* *fl.* white; pedicels red, sub-umbellate, secund, drooping; racemes simple, axillary. June. *l.* nearly opposite, or three to five in a whorl, on short petioles, cuneate-oblong, acute, glabrous, serrated; 4in. long. *h.* 1ft. Japan. Perhaps the hardiest of all the species.

A. macrocarpa (large-fruited).* *fl.* flesh-coloured, dotted; petals ovate, obtuse; racemes terminal, corymbose, almost sessile, slightly hairy. Berries vermilion coloured, as large as gooseberries. *l.* oblong, acute, tapering downwards, glandularly crenated, dotted, close together, leathery, 6in. to 8in. long, paler beneath, veinless. *h.* 5ft. to 6ft. Nepaul, 1824. A beautiful shrub.

A. Oliveri (Oliver's).* *fl.* rose pink, white eye; corolla rotate, ½in. across; lobes obtuse; heads terminal, consisting of a number of stalked, many-flowered corymbs; pedicels about twice as long as the flower. July. *l.* nearly sessile, entire, glabrous, 6in. to 8in. long, by 2in. in the broadest portion; oblanceolate, acuminate, tapering towards the base. Costa Rica, 1876.

A. paniculata (panicled).* *fl.* rose-coloured; panicles terminal, composed of many alternate compound branches, large and elegant; petals and sepals ovate. July. Berries red, smooth, size of a pea, juicy. *l.* glabrous, cuneate-oblong, almost sessile, reflexed, 6in. to 20in. long, and from 3in. to 5in. broad, crowded at the ends of the branches. *h.* 8ft. to 10ft. India, 1818.

A. punctata (dotted). *fl.* greyish white, sub-campanulate, secund, beset with dark dots, and the pedicels with dark lines; peduncles umbellate, terminal, and axillary; umbels involucrated by deciduous bracts. June. *l.* glabrous, lanceolate, leathery, repandly crenated, tapering to the base. *h.* 6ft. to 10ft. China, 1822.

A. serrulata (finely serrated).* *fl.* deep red; petals ciliated; calyces and pedicels coloured; panicles terminal; pedicels umbellate. July. *l.* glabrous, lanceolate, acuminated, wrinkled, serrulated, beset with rusty dots beneath; branches downy. *h.* 2ft. to 3ft. China, 1820.

A. villosa (hairy). *fl.* whitish; umbels axillary and terminal, very villous. October. Berries villous. *l.* lanceolate, acuminated, villous beneath, crenulated, 5in. to 7in. long, tapering to the base, copiously dotted. China. All the upper parts of the plant are densely beset with hairs.

A. v. mollis (soft).* This variety has very fine red berries, and is superior to the type.

A. Wallichii (Wallich's). *fl.* red, in loose racemes; peduncles axillary, one-half shorter than the leaves, and are, as well as the pedicels, pilose. July. *l.* obovate, acute, or obtuse, narrowed into the marginate petioles, repandly crenulated, 4in. to 5in. long, and 2in. broad, thickish. *h.* 2ft. India.

ARDUINA (in honour of P. Arduini, curator of the Economical Garden of Padua, in the time of Linnæus). ORD. *Apocynaceæ*. A singular and pretty greenhouse evergreen shrub, of easy culture in carefully drained pots of peat and loam, mixed in equal proportions. Propagated by cuttings in sand, under a glass. The winter temperature should not be allowed to fall below 40deg.

A. bispinosa (two-spined). *fl.* small, white, sweet-scented, terminal, corymbose. March to August. Berry red. *l.* cordate-ovate, mucronate, nearly sessile, dark green, larger than those of BOX. Spines twin, simple, but usually bifid; in this last case, one of the clefts points downwards, and the other upwards. *h.* 3ft. to 5ft. Cape of Good Hope, 1760. SYN. *Carissa Arduina.*

ARECA (*Areec* is its name in Malabar, when an old tree). The Cabbage Palm. ORD. *Palmæ*. This genus is now broken up into several, and many species formerly here arranged are now found under *Acanthophœnix*, *Euterpe*, *Hyophorbe*, *Kentia*, *Oncosperma*, *Phœnicophorum*. Very ornamental and graceful stove Palms, with a branching spadix, and double spathe, which incloses the flowers. Flowers unisexual, borne upon the same spike; female flowers having six rudimentary stamens, and male flowers a six-cleft perianth. Fruit one-seeded. They thrive in a compost of loam, peat, and leaf soil, in equal parts, with a liberal addition of sand; but when they are fully grown,

Areca—*continued.*

loam should preponderate to the extent of about two-thirds, and some rotten cow-manure may be added. Propagated from seeds, which should be sown in a compost similar to above, and placed in a moist gentle heat. They are employed, when young, with much success for the decoration of drawing rooms and dinner tables.

A. Aliciæ (Princess Alice's). *l.* pinnatisect; segments sessile. North Australia. A very handsome species, with a comparatively dwarf habit; it is a valuable decorative plant.

A. Catechu (Catechu). *l.* pinnate, from 3ft. to 6ft. long; leaflets 12in. to 24in. in length, and about 2in. broad, light green; petioles broadly sheathed at the base. *h.* 30ft. India, 1690. One of the best and oldest species in cultivation, very effective, in a young state, for dinner table decoration. It produces the Betel nut, of which enormous quantities are used in India.

A. concinna (neat). *l.* pinnatisect, sub-glabrous; segments sickle-shaped, much acuminated. Stem green, 8ft. to 12ft. high, 1in. to 2in. in diameter. Ceylon. The Cingalese chew the albumen of the seeds with their Betel.

A. gigantea (gigantic). A synonym of *Pinanga ternatensis.*

A. glandiformis (gland-formed). *l.* pinnatisect, 9ft. to 12ft. long when fully grown. *h.* 30ft. Moluccas. A handsome stove palm, of bold aspect, and very suitable, when young, for decorative purposes.

A. Normanbyi (Normanby's). A synonym of *Ptychosperma Normanbyi.*

A. triandra (three-stamened). *l.* pinnate, like those of *A. Catechu* in size, &c. *h.* 20ft. India, introduced to Britain about 1810.

ARENARIA (from *arena*, sand; in which most of the species are found). Sandwort. ORD. *Caryophylleæ.* TRIBE *Alsineæ.* A very large genus of hardy herbaceous plants, consisting of about 150 species. It is distinguished by having generally three styles. The perennials only are worth growing; these are extremely pretty little alpine plants, and will thrive in any ordinary soil in exposed places; the rarer species may be grown in small pots, well drained, in a mixture of sand, loam, and leaf soil, or in well-drained crannies of the rockery. They may be increased by either division, seeds, or cuttings; the latter, placed under a hand-glass, will root freely. The best time to divide the plants is early spring, or July and August. Seeds should be sown in spring in a cold frame.

A. balearica (Balearic).* *fl.* white, sepals erect; peduncles elongated, one-flowered. March to August. *l.* very small, ovate, shining, rather fleshy, ciliated. *h.* 3in. Corsica, 1787. A pretty little creeper, one of the best plants for covering damp borders of the rockwork.

A. cæspitosa (tufted). Synonymous with *A. verna cæspitosa.*

A. ciliata (ciliated). *fl.* white, usually solitary; sepals ovate, acute, five to seven ribbed; petals obovate, twice as long as the sepals. July. *l.* ovate, or obovate, roughish, with a few hairs, one-nerved, and ciliated. Ireland. *h.* 6in. A thick, tufted, spreading, procumbent plant.

A. graminifolia (grass-leaved).* *fl.* white; panicle three-forked, hairy, loose; sepals very blunt, much shorter than the obovate petals. June. *l.* long, awl-shaped, filiform, scabrous on the margins from serratures. Stem erect, simple. *h.* 6in. to 9in. Caucasus, 1817.

A. grandiflora (large-flowered).* *fl.* white, usually solitary; peduncles very long, pubescent; sepals ovate, awned, three-nerved, smaller than the petals. June. *l.* awl-shaped, broadish, flat, three-nerved, ciliated, radical ones crowded. *h.* 3in. to 6in. France, 1783. *A. g. biflora* is a two-flowered, and *A. g. triflora* a three-flowered, variety.

A. laricifolia (Larch-leaved).* *fl.* white; sepals bluntish, triple nerved, hairy; petals twice as long as the sepals; stems ascending, one, three, or six flowered, somewhat scabrous; calyx cylindrical. June. *l.* awl-shaped, denticulately ciliated. *h.* 6in. Switzerland, 1816.

A. longifolia (long-leaved). *fl.* white; sepals ovate, obtuse, not half the length of the obovate petals; panicle three-forked, glabrous, crowded. June. *l.* awl-shaped, filiform, serrulated. Stem erect, simple. *h.* 6in. to 9in. Siberia, 1823.

A. montana (mountain). *fl.* large, white; peduncles terminal, very long, one-flowered; sepals lanceolate, acuminated, much shorter than the corolla. April. *l.* lanceolate-linear; sterile stems very long, procumbent. *h.* 3in. France and Spain, 1800.

A. peploides (Peplis-like). *fl.* white; sepals ovate, shorter than the oblong petals. May to July. *l.* ovate, light green, rather fleshy; branches procumbent, fleshy, deciduous. *h.* 3in. to 4in. Sea shores of Britain. SYN. *Honckenya peploides.*

A. purpurascens (purplish).* *fl.* purplish; pedicels tomentose, scarcely exceeding the leaves; sepals lanceolate, smooth, with shrivelled margins, longer than the corolla; branches two to three-

Arenaria—*continued.*

flowered. May. *l.* ovate-lanceolate, acuminated, glabrous. Plant tufted, decumbent. *h.* 6in. Higher Pyrenees.

A. rotundifolia (round-leaved).* *fl.* white, solitary; petals roundish-ovate, longer than the sepals. July and August. *l.* about ¼in. across, roundish, ciliated, on spreading tufted branches. *h.* 4in. to 6in. Siberia.

A. tetraquetra (four-angled). *fl.* white, somewhat capitate; sepals stiff, acute, keeled, ciliated, almost equal in length to the corolla. August. *l.* ovate, keeled, recurved, edged, imbricated in four rows. Stem straight, pubescent. *h.* 3in. to 6in. France, 1731.

A. verna (spring-flowering). *fl.* small, white; sepals ovate, lanceolate, acuminated, with three remote equal ribs, longer than the obovate petals. May. *l.* awl-shaped, bluntish. Stems panicled, elongated. *h.* about 3in.

A. v. cæspitosa (turfy). A variety having very leafy stems. Calyces and peduncles smoothish. Europe. SYN. *A. cæspitosa.*

ARENGA (name of doubtful origin). SYN. *Saguerus.* ORD. *Palmæ.* An extremely useful and interesting Palm. The medulla of the trunk is used as sago, and the saccharine juice forms excellent sugar. It requires a strong heat and rich mould. Propagated by seeds only.

A. saccharifera (sugar-bearing). *fl.* striped. June. *h.* 40ft. Moluccas, 1829.

AREOLATE. Divided into distinct angular spaces, or areolæ.

ARETHUSA (mythological: named after a nymph of Diana's, who was changed into a fountain; in allusion to the habit of the plants). ORD. *Orchideæ.* A small genus of very pretty, but rare, terrestrial Orchids. They require a moist shady spot with a northern aspect, and thrive best in a compost of well-rotted manure and sphagnum. A mulching in winter, by way of protection, is needed.

A. bulbosa (bulbous).* *fl.* large, bright rose purple, solitary, sweet-scented, terminal; lip dilated, recurved, spreading towards the summit, bearded-crested down the face; scape one-leaved. May. *l.* linear, nerved. *h.* 8in. Carolina.

ARETIA. *See* **Androsace.**

ARGANIA (from *argam*, its aboriginal name). ORD. *Sapotaceæ.* A very fine greenhouse evergreen tree, said by Don to flourish against a south wall, out of doors, with the protection of a mat in severe weather. It will thrive in ordinary garden soil. Increased by layers and cuttings in autumn and spring, the latter requiring a bell glass covering; both operations must be performed in a moderately heated greenhouse.

A. Sideroxylon (Iron-wood). *fl.*, corolla greenish yellow, cup-shaped, five-parted, with ovate-lanceolate, sub-emarginate segments; lateral and axillary, scattered, crowded, sessile. *fr.* dotted with white, size of a plum, full of white, milky juice. July. *l.* lanceolate, entire, bluntish, glabrous, paler beneath; branches terminated by strong spines. *h.* 15ft. to 20ft. Morocco, 1711. As the specific name implies, the wood is excessively close and hard, so much so that it sinks in water. SYNS. *Elæodendron Argan, Sideroxylon spinosum.*

ARGEMONE (from *argema*, cataract of the eye; in allusion to some real or fancied medicinal properties possessed by the plants). ORD. *Papaveraceæ.* A genus of very handsome and showy annual or perennial herbs, abounding with a yellowish juice, and covered with stiff prickles. Sepals two or three, concave, mucronate; petals four to eight; peduncles axillary, always erect. Leaves sessile, repand-sinuate, usually spotted with white; recesses spiny-toothed. The five species here described are hardy annuals, and will thrive in almost any ordinary garden soil in the open border. Seed may be sown out of doors about the end of March; those of the rarer species on a hotbed, the seedlings being planted out about the end of June.

A. albiflora (white-flowered).* *fl.* white; petals usually three. July and August. *l.* sessile, feather-nerved. *h.* 1ft. Georgia, 1820.

A. grandiflora (large-flowered).* *fl.* white, with yellow anthers, large, panicled. July. *l.* sinuate, smooth, glaucous, spiny-toothed; nerves unarmed. *h.* 2ft. to 3ft. Mexico, 1827. See Fig. 147.

A. hirsuta (hairy).* *fl.* pure white, 3in. to 5in. in diameter. September. *l.* pinnatifid, bristly. *h.* 2ft. California, 1879. A very beautiful plant.

Argemone—*continued.*

FIG. 147. INFLORESCENCE OF ARGEMONE GRANDIFLORA.

A. mexicana (Mexican). Devil's Fig. *fl.* solitary, yellow; petals four to six. June. *l.* profoundly repand-sinuated, spiny, blotched with white. *h.* 2ft. Mexico, 1592.

A. ochroleuca (yellowish-white).* *fl.* pale yellow, solitary; petals six. August. *l.* profoundly sinuated or pinnatifid, glaucescent; nerves with prickly bristles, blotched with white. Stem prickly. Mexico, 1827.

ARGENTEUS. Silvery. A pale colour resembling silver.

ARGOLASIA. *See* **Lanaria.**

ARGYREIA (from *argyreios*, silvery; in reference to the silvery undersides of the leaves). Silver-weed. ORD. *Convolvulaceæ.* An elegant genus of greenhouse and stove climbers. Sepals five; corolla campanulate. Shrubs for the most part silvery, but sometimes silky and tomentose. The greater number of the species are robust, extensive twiners or climbers, usually requiring plenty of room to run, before they will flower. *A. cuneata*, and one or two others, are of dwarf habit, and produce their splendid blossoms in abundance. All the species grow well in light rich soil, or a mixture of peat, loam, and sand. Cuttings root readily if planted in sand, with a hand glass placed over them, in a little bottom heat.

A. capitata (headed). *fl.*, corolla 1in. to 2in. long, rose coloured or purple, hairy outside; peduncles exceeding the petioles. July. *l.* cordate-ovate, acuminated, 2in. to 5in. long, and 1in. to 3in. broad, hairy on both surfaces; hairs glandular at the base. Plant clothed with strigose hairs. Silhet, 1823.

A. cuneata (wedge-leaved).* *fl.*, corolla large, of a beautiful deep bright purple; peduncles downy, shorter than the leaves, three to six-flowered. July. *l.* obovate-cuneate, emarginate, glabrous above, but beset with short, crowded hairs beneath, hardly petiolate. Stem clothed with powdery down at top. *h.* 2ft. to 5ft. India, 1822.

Argyreia—*continued.*

A. cymosa (cyme-flowered).* *fl.*, corolla pale pink, tubularly funnel-shaped, villous outside; peduncles as long or longer than the leaves, leafy at top, and cymosely many-flowered. *l.* roundish-cordate, or reniformly-cordate, obtuse, terminated by a very short prickle, glabrous on both surfaces, or clothed with pruinose down. Malabar (mountains), 1823.

A. malabarica (Malabar). *fl.* rather small; bottom of the bell deep purple; throat pink, with the edges paler, almost white, and slightly ten-lobed; peduncles as long or longer than the leaves, many-flowered at the apex. June. *l.* roundish-cordate, acute, glabrous, or furnished with a few scattered hairs on both surfaces. Coromandel, 1823.

A. pomacea (Apple-fruited). *fl.* large, rose coloured; peduncles villous, exceeding the petioles a little, cymose, many-flowered. Berry size of a cherry, yellow. *l.* ovate-elliptic, obtuse, clothed with cinerous, velvety down on both surfaces, but especially beneath, sometimes sub-emarginate at apex. Mysore, 1818.

A. speciosa (showy).* *fl.*, corolla nearly 2in. long, of a deep rose colour; peduncles about equal in length to the petioles, umbellately capitate. July. *l.* 3in. to 12in. long, and 2in. to 4in. broad, cordate, acute, glabrous above, or rarely villous, thickly nerved beneath, and clothed with silky, silvery down. India, 1818.

A. splendens (splendid).* *fl.*, corolla tubularly campanulate, 1½in. long, rather villous outside, pale red; peduncles exceeding the (hoary) petioles, corymbosely many-flowered. November. *l.* ovate-oblong or ovate-elliptic, entire or pandurately sinuated, sometimes somewhat three-lobed, smooth above, but clothed with silvery, silky down beneath, 6in. long, acuminated. India, 1820.

ARGYROCHÆTA. A synonym of **Parthenium** (which *see*).

ARGYROXYPHIUM (from *argyros*, silver, and *Xyphion*, a Corn-flag; in allusion to the leaves). ORD. *Compositæ.* An ornamental greenhouse perennial herb. Involucre campanulate; receptacle conical; heads pedunculate, racemose, or in thyrsoid panicles. Leaves alternate; lower ones close, elongated, thick, on both sides silver-lined. Stems simple or slightly branched. It thrives well in rich sandy loam and leaf mould. Propagated by seed-heads.

C. sandwicense (Sandwich Islands). *fl.-heads* purplish. *l.* linear lanceolate, imbricate, clothed, like the stems, with silvery hairs. *h.* 3ft. Sandwich Islands, 1872. SYN. *Argyrophyton Douglasii.*

ARIA. *See* **Pyrus Aria.**

ARISÆMA (from *Aron*, Arum, and *sana*, a standard; in reference to the close alliance to *Arum*). ORD. *Aroideæ* (*Araceæ*). Small, tuberous-rooted, greenhouse (except where stated otherwise) herbs. Spathe rolled round the spadix at the base; spadix bearing unisexual flowers below, and rudimentary flowers in the upper part. Leaves peltate, pedate, palmate, or simple. For culture, &c., *see* **Arum.**

A. concinna (neat).* *fl.*, spathe convolute, tubular at the base; upper portion bent over at the mouth, and gradually narrowed into a tail-like appendage about 3in. long; spathe of the female plant longitudinally barred with white and green, the latter colour being replaced with blue-purple in the male. June. *l.* solitary, sheathing at the base, and made up of ten or twelve lanceolate, entire, light green leaflets, which radiate from the top of the petiole, the latter being 1ft. to 2ft. high. Sikkim, 1871.

A. curvatum (curved).* *fl.* crowning a scape which overtops the foliage; tube of spathe cylindrical, green, obscurely striped with white; the elliptic blade arches forward, green on the inner surface, and brownish-red on the outer; spadix produced into a purplish-red tail, about 1ft. long. April. *l.* pedate. The large bracts, which sheath the base of the stem, are beautifully marbled with dark olive green, red, and light green. *h.* 4ft. Himalayas, 1871. SYN. *A. helleborifolium.*

A. galeata (helmeted).* *fl.*, spathe about 4in long; tube and cylindrical side of spathe green, tinted purplish at base, with many longitudinal white lines; inside of the tube purple. July. *l.* solitary, trifoliolate; middle leaflet 6in. long by 3½in. broad; lateral ones 7in. long and nearly 4in. broad. *h.* 1ft. Himalayas, Sikkim, 1879.

A. Griffithi (Griffith's).* *fl.*, spathe large, hood-like, brown-violet, with green veins; spadix brown-violet, and the barren end at the base above the flowers has a disk-like projection, while its free extremity is prolonged into a long thread-like appendage. Spring. *l.* with bold roundish leaflets. *h.* 1ft. to 1½ft. Sikkim, 1879. Hardy; very handsome. SYN. *A. Hookerianum.*

A. helleborifolium (Hellebore-leaved). A synonym of *A. curvatum.*

A. Hookerianum (Hooker's). A synonym of *A. Griffithi.*

A. nepenthoides (Nepenthes-like).* *fl.*, spathe above the tubular portion extended into two decided auricles, which serve to distinguish it from other species, ochre, brown, green; spadix yellowish. Spring. *l.* pedate, of five lanceolate or oblanceolate

Arisæma—*continued.*

leaflets; central one 6in. long, the others shorter. *h.* 2ft. Himalayas, 1879.

A. præcox (early). A synonym of *A. ringens.*

A. ringens (gaping).* *fl.*, spathe striped green and white, erect and cylindrical below, then arching suddenly over, and again contracting into a rather small deep purple orifice, with broad, reflexed margins; spadix erect, pale yellow-green. Spring. *l.*, leaflets three, ovate-oblong, acuminate, and produced into a filiform point; peduncle short. Japan. Hardy. SYNS. *A. præcox* and *A. Sieboldi.*

A. Sieboldi (Siebold's). A. synonym of *A. ringens.*

A. speciosa (showy).* *fl.*, spadix deep glossy purple, greenish and white, with a long flexuous prolongation, sometimes nearly 20in. in length; spathe also terminating with a filiform elongation. March. *l.* solitary, trifoliolate; leaflets petioled, dark green, conspicuously edged with blood red; petioles long, mottled with white. *h.* 2ft. Temperate Himalayas, 1872.

FIG. 148. ARISÆMA TRIPHYLLA.

A. triphylla (three-leaved).* *fl.*, spathe 4in. to 6in. long, striped with broad lines of purplish-brown, with about 1in. of green in the middle; spadix 3in. long, spotted with brown. June and July. *l.* on long, stout petioles, trifoliolate; leaflets entire, equal, acuminated. *h.* 9in. to 1ft. North America, 1664. This is quite hardy. SYNS. *A. zebrina* and *Arum triphyllum.* See Fig. 148.

A. zebrina (zebra). A synonym of *A. triphylla.*

ARISARUM (name of Greek origin). ORD. *Aroideæ* (*Araceæ*). A small genus of half-hardy, herbaceous plants, possessing but little horticultural interest, and allied to *Arisæma.* Flowers unisexual, spadix having no rudimentary flowers. Leaves on long stalks, heart-shaped or spear-shaped. The only species in cultivation thrives in a sand, loam, and peat compost. Propagated by seeds or divisions of the root in spring.

A. vulgare (common). *fl.*, spathe livid purple. May. *h.* 1ft. South Europe, 1596.

ARISTATE. Having a beard or awn, as the glumes of barley.

ARISTEA (from *arista*, a point or beard; in reference to the rigid points of the leaves). ORD. *Irideæ.* A genus of greenhouse herbaceous perennials from the Cape of Good Hope. Flowers blue; perianth rotate, six-parted, twisted after flowering; scape two-edged, rigid, often branched. Leaves narrow, sword-shaped. The species are more interesting than ornamental, and may be grown in a compost of three parts turfy peat, and one of loam. Easily propagated by divisions and seeds. They vary in height from 3in. to 3ft., and flower generally in summer.

A. capitata (headed). *fl.* blue. July. *h.* 3ft. Cape of Good Hope, 1790.

A. cyanea (bright blue). *fl.* blue. June. *h.* 6in. Cape of Good Hope, 1759.

ARISTOLOCHIA (from *aristos*, best, and *locheia*, parturition; in reference to its supposed medicinal character). Birthwort. ORD. *Aristolochiaceæ.* A very large genus of stove, greenhouse, or hardy, evergreen or deciduous, climbing or erect shrubs. Flowers axillary, clustered, or solitary, pendulous, of most extraordinary forms; perianth tubular, curved, or straight, with an oblique, cordate limb; stamens six, rarely four, or numerous, adhering to the stigma; capsule six-valved. Leaves cordate entire or lobed. Good loam, with a small proportion of decayed manure and a slight addition of sharp sand to secure efficient drainage, is a good compost for the whole. They will thrive when planted out in the conservatory more satisfactorily than elsewhere; for as they usually grow a considerable height before flowering, they require very long trellises in pots, and have to be trained up and down; or, better still, round a pillar of uniform circumference, a pyramid form being useless. The best way is to train them round, close down to the pot, and keep on about 2in. from one turn to the next. Some of the larger sorts will require more room. Cuttings root freely in sand under a bell glass with bottom heat.

A. anguicida (snake-killing). *fl.* white, spotted brown; tube of perianth inflated at base, dilated and oblique at the mouth; peduncles axillary, solitary, one-flowered. December. *l.* on short petioles, cordate acuminate; stipules cordate-roundish. *h.* 10ft. New Grenada, 1845. An evergreen stove twiner.

A. barbata (bearded). *fl.* purple, axillary, 2½in. long; perianth straight; limb spreading; lip spathulate, bearded at the end. July. *l.* cordate, oblong. *h.* 10ft. Caraccas, 1796. Stove evergreen.

A. caudata (tailed).* *fl.* lurid; perianth cylindrical ventricose, and six-spurred at the base; lip cordate, cuspidate; the cusp twisted, filiform. June. *l.*, lower ones reniform, lobed; upper ones three partite. *h.* 5ft. Brazil, 1828. Deciduous stove twiner.

A. ciliosa (fringed).* *fl.* purple-yellow; tube of perianth obliquely ventricose at base, stretched out, from the middle to the apex cylindrical, fringed; peduncles one-flowered. September. *l.* cordate reniform. Plant glabrous. *h.* 6ft. Brazil, 1829.

A. Clematitis (Clematis-like). *fl.* pale yellow, upright; lip oblong, shortly acuminate. July. *l.* cordate. Stem erect. *h.* 2ft. A hardy herbaceous perennial, naturalised here and there in Britain.

A. clypeata (shielded). *fl.* axillary; tube yellowish, cylindrical; limb elliptic, white, blotched with purple, long and large, funnel-shaped. *l.* subcordate-ovate, acuminate. Columbia, 1871.

A. cordiflora (cordate-flowered). *fl.* axillary, very large, with broad cordiform limb, creamy yellow, with blotchy purple veining. May. *l.* cordate acuminate. *h.* 30ft. Mexico, 1860.

A. deltoidea variegata (deltoid variegated variety). *l.* variegated with white. *h.* 6ft. Columbia, 1870.

A. Duchartrei (Duchartre's).* *fl.* racemose; tube brown; limb cream colour, with purple blotches. January. *l.* reniform-cordate, acuminate. Upper Amazons, 1868. *h.* 5ft. This stove species flowers from the old wood. SYN. *A. Ruiziana.*

A. floribunda (free-flowering).* *fl.* numerous; limb purplish-red, with yellow veins, centre yellow. July. *l.* cordate ovate, acuminate. *h.* 10ft. Brazil, 1868. Stove species.

A. galeata (helmeted). *fl.* creamy, with reticulated veins. August. *l.* cordate, with broad open sinus. *h.* 20ft. New Grenada, 1873.

A. gigas (giant). *fl.* purple; perianth large, cordate ribbed outside, reticulated, downy; tube inflated, contracted in the middle; limb large, cordate ovate, with a long tail. June. *l.* downy, cordate, acuminate; peduncles solitary, bracteate. *h.* 10ft. Guatemala, 1841.

A. Goldieana (Goldie's).* *fl.* greenish outside, deep yellow with chocolate veins inside, bent into two unequal portions, the lower portion surmounting the ovary about 8in. in length, somewhat cylindrical, terminating in a club-shaped curved knob; the upper portion, commencing from this knob, is about a foot long, funnel-shaped, ribbed, dilated above into a somewhat three-lobed limb. Stamens twenty-four—a very unusual number in the whole family. The enormous flowers are 26in. long by 11in. in diameter. July. *l.* ovate, or triangular-cordate, acuminated. Old Calabar River, 1867. This noble climber should be repotted in fresh soil in February or March. But little water will be necessary until the young shoots have made about 6in. of growth; the quantity should then be increased with moderation until early in September, when the old stem dies down within a few inches of the surface of the pot—at this period, and during winter, water must be entirely withheld. This species blooms freely in a temperature of 65deg. to 70deg.

A. indica (Indian). *fl.* purple; perianth erect; peduncle many-flowered. July. *l.* elliptical, blunt, somewhat emarginate, slightly cordate. *h.* 10ft. India, 1780. Stove evergreen.

A. labiosa (great-lipped).* *fl.* greenish; perianth incurved at base, saccate, two-lipped in the middle. July. *l.* reniform, roundish cordate, amplexicaul. *h.* 20ft. Brazil, 1821. Stove evergreen.

Aristolochia—*continued.*

A. leuconeura (white-veined). *fl.* purple brown. September. *l.* cordate, acuminate. *h.* 12ft. Magdalena, 1858. Stove species.

A. odoratissima (sweetest-scented).* *fl.* purple, sweet-scented; peduncles one-flowered, longer than the leaf; lip cordate lanceolate, longer than the perianth. July. *l.* cordate, ovate, evergreen. Stem twining. *h.* 10ft. Jamaica, 1737. Stove evergreen.

A. ornithocephala (bird's-head).* *fl.* purple, very large, and extremely singular. To render any description at all lucid, this species may be said to have the head of a hawk and the beak of a heron, with the wattles of a Spanish fowl, which, however, are grey, netted with brown; head of the same colour, veined; and the beak grey. *l.* between cordate and reniform, obtuse. October. *h.* 20ft. Brazil, 1838. Stove species.

A. ringens (gaping).* *fl.* extremely grotesque, 7in. to 10in. long, pale green, marbled and reticulated with black purple. The perianth has an obovoid ventricose sac, or cup, 2½in. long, which is woolly inside; tube ascending obliquely from the sac, terete, dividing into two very long lips, the upper of which (lower as the flower hangs) is oblong-lanceolate, recurved, and hairy inside below the middle, while the lower one is shorter, with recurved margins, and expanding into an orbicular or almost reniform limb. Unlike many other species, the flowers are produced on the young shoots. July. *l.* bright green, glabrous, roundish-reniform. *h.* 20ft. Brazil, 1820. Stove evergreen.

A. Ruiziana (Ruiz's). A synonym of *A. Duchartrei.*

A. saccata (pouch-flowered). *fl.* purplish-red, forming a large pouch; throat circular, vertical. September. *l.* 12in. to 15in. long, and 4in. broad, scattered, ovate-cordate, narrowed at apex, slightly waved and sinuated, entire, more silky beneath than above. *h.* 20ft. Sylhet, 1829. Stove evergreen.

A. sempervirens (evergreen). *fl.* purple; perianth incurved. May. *l.* cordate, oblong, acuminate. Stem prostrate, flexuous, somewhat climbing. *h.* 4ft. Candia, 1727. Greenhouse species.

FIG. 149. FLOWERING BRANCH OF ARISTOLOCHIA SIPHO.

A. Sipho (tube-bearing).* *fl.* yellowish-brown; corolla ascending; limb in three equal portions, not expanding, flat, brown; bracts of the peduncle large, ovate. May and June. *l.* cordate, acute. Stem twining. *h.* 15ft. to 30ft. North America, 1763. This hardy, climbing, deciduous shrub grows freely in a deep, free, rather dry soil. See Fig. 149.

A. Thwaitesii (Thwaites'). *fl.* yellow. March. *h.* 3ft. Old Calabar, 1854. Stove species.

A. tomentosa (tomentose).* *fl.* purple; perianth with its tube twisted back, and much more deeply divided than in *A. Sipho*, expanding, flat, and yellow, with the mouth of the tube of a deep purple; peduncle solitary, without a bract. July. *l.* cordate, downy beneath. *h.* 20ft. North America, 1799. Hardy.

A. tricaudata (three-tailed).* *fl.* dark purple-brown, solitary, split into three subulate tails. August. *l.* oblong acuminate, rugose, 5in. to 8in. long. Mexico, 1866. A curious, but pretty, stove shrub.

A. trilobata (three-lobed). *fl.* purple; perianth cylindrical, broken saccate at base; lip cordate cuspidate. June. *l.* three-lobed Stem twining. *h.* 8ft. South America, 1775. Stove evergreen.

Aristolochia—*continued.*

A. ungulifolia (claw-leaved). *fl.* racemose; perianth brownish-purple, stipitate at base, above which it is swollen out in a globose or oblong form, with two thickened projections near the end; upper end of tube contracted, somewhat curved, terminating in a two-lipped limb, one lip large, ovate, the other minute. June. *l.* 6in. to 7in. long, cordate, and pedately five-nerved at the base, three-lobed below the middle, with broad sinuses, the two lateral lobes arcuate, and blunt at the apex. Labuan, 1880. Stove species.

ARISTOLOCHIACEÆ. An order of very curious plants, with singularly inflated flowers, consisting of a calyx only, of a dull, dingy colour. It is popularly known as the Birthwort family, and has an English representative in *Aristolochia clematitis.*

ARISTOTELIA (said to be named in honour of Aristotle, the Greek philosopher). ORD. *Tiliaceæ.* A hardy evergreen shrub. Calyx campanulate; petals five, inserted in the base of the calyx, and alternating with its lobes. Easily grown, in ordinary garden soil, in the shrubbery. Propagated by ripened cuttings, which root freely if placed under a hand glass; or by layers.

A. Macqui (Macqui's).* *fl.* small, greenish, axillary. May. *l.* nearly opposite, stalked, oblong, acute, smooth, shining, dentate, permanent. *h.* 6ft. Chili, 1733. A shrub esteemed for its handsome foliage. The berries are about the size of a pea, very dark purple, at length becoming black. The variegated form is not so hardy as the type, but much more ornamental.

ARMENIACA (from Armenia, the native country of the Apricot). Apricot. ORD. *Rosaceæ.* TRIBE *Drupaceæ.* Small, hardy, deciduous trees. Flowers appearing before the leaves from scaly buds, solitary, or few together, almost sessile. Leaves, when young, convolute. Drupe ovate-globose, fleshy, covered with velvety skin, containing a nut, or stone, which is acute at one end and blunt at the other, with a furrow on both sides; the rest smooth, not wrinkled. For culture, &c., *see* **Apricot** and **Prunus.**

A. brigantiaca (Brigancon).* *fl.* white or pink, glomerate, almost sessile. March. *l.* somewhat cordate, acuminated, sharply toothed; the teeth numerous, and lapping over each other. *h.* 6ft. to 8ft. South Europe, 1819.

A. dasycarpa (thick-fruited).* *fl.* white, pedicellate; pedicels filiform. March. *l.* ovate, acuminate, serrated; petioles glandular. *h.* 10ft. to 15ft. China, 1800.

A. sibirica (Siberian). *fl.* rose-coloured. April. *l.* ovate, acuminate; petioles glandless. *h.* 8ft. to 20ft. Dahuria, 1788.

A. vulgaris (common).* Common Apricot. *fl.* pinkish-white, sessile. February. *l.* ovate, or cordate, glabrous, glandularly serrated. *h.* 15ft. Levant, 1548. Of this species numerous varieties, differing in the foliar outline, &c., are sometimes met with. *See* **Apricot.**

ARMERIA (from *Flos Armeriæ*, Latin name for the flowers of a species of Pink). Thrift; Sea Pink. ORD. *Plumbagineæ.* A very interesting and pretty group of hardy alpine tufted perennials. Flowers pedicellate, collected in dense solitary heads; involucre scarious, sheathing the scape and turned downwards; petals cohering at the base, persistent; flower scapes leafless. Leaves linear, radical. As the majority of the species differ in mere technical details, we have given a representative group only. They are easily cultivated in a sandy loam and leaf soil, and are increased by seeds and division, separate pieces being planted as cuttings under hand glasses; or the rarer kinds should be potted and placed in a frame. The seed should be sown in spring, in pots of sandy soil, and placed in a cold frame. Although best grown as rock plants, most of them do well in pots and borders. *A. vulgaris* makes one of the best of edging plants.

A. cephalotes (round-headed).* *fl.* deep rose or crimson, in a large roundish head on erect stalk. Autumn. *l.* broadly lanceolate, glabrous, acute; petioles channelled, sheathing at the base. *h.* 12in. to 18in. South Europe, 1800. This is perhaps the finest species, and is best raised from an annual sowing of seed, as it is somewhat difficult to increase by divisions. SYNS. *A. formosa, A. latifolia, A. mauritanica,* and *A. pseudo-armeria.*

A. dianthoides (Pink-like).* *fl.* light pink, in close heads about 6in. high. May and June. *l.* spreading, flattened, nerved, slightly downy. South Europe, 1810.

A. formosa (handsome). Synonymous with *A. cephalotes.*

A. juncea (Rush-like).* *fl.* rose pink, in small heads about 3in. high. June. *l.* small, erect, roundish, pointed, deep green. South Europe. A very pretty little alpine species.

Armeria—*continued.*

A. juniperifolia (Juniper-leaved).* *fl.* deep rose, in small densely packed heads. May and June. *l.* short, stiff, erect, Juniper-like. *h.* 6in., with a dense tufted habit. Spain, 1818. Plant in a warm well-drained portion of the rockery in very sandy soil, with some nodules of sandstone intermixed.

A. latifolia (broad-leaved). Synonymous with *A. cephalotes.*

A. leucantha (white-flowered). A white-flowered variety of *A. plantaginea.*

A. maritima (sea). Synonymous with *A. vulgaris.*

A. mauritanica (Mediterranean). Synonymous with *A. cephalotes.*

A. plantaginea (Plantain-leaved).* *fl.* bright rose; scapes taller than in *A. vulgaris.* *l.* broader, three to five-nerved, and with a stouter growing habit than the common species. *h.* 1ft. South Europe, 1818. A very pretty species. SYNS. *A. leucantha*, which is frequently called *A. p. alba*, and *A. scorzoneræfolia.*

A. pseudo armeria (false Armeria). Synonymous with *A. cephalotes.*

A. scorzoneræfolia (Scorzonera-leaved). Synonymous with *A. plantaginea.*

A. setacea (bristly).* *fl.* light rose, in small heads about 2in. high, very freely produced from the axils of the leaves. April to June. *l.* in dense rosettes, erect, or nearly so, narrow, acute, the tufts having a bristly appearance. *h.* 3in. South Europe. Plant in a semi-perpendicular cranny of the rockery, with a sunny position.

A. vulgaris (common).* Common Thrift; Sea Pink. *fl.* pink, rosy red, lilac, or white (the latter known as *A. v. alba*), collected into a rounded head on the top of the simple scape. June to August. *l.* all radical, numerous, linear, usually one-nerved, more or less pubescent. *h.* 6in. to 12in. Britain, on the sea coasts. *A. v. alpina* is a dwarf alpine form of this species. The white-flowered variety is very handsome. *A. v. Laucheana* is also a pretty form, with deep pink flowers in dense heads about 6in. high, and a very tufted habit. *Crimson Gem*, of garden origin, is stronger growing, with stems about 9in. high, carrying heads of bright crimson pink flowers, also of tufted habit. SYNS. *A. maritima*, *Statice Armeria.*

ARNEBIA (its Arabian name). ORD. *Borragineæ.* Handsome hardy herbaceous perennials or annuals, allied to *Lithospermum.* Cuttings should be removed with a heel in autumn, dibbled in sandy soil in small pots, and placed in a cool house, where they will ultimately, though slowly, root; they should then be gradually hardened off, and finally planted out. *A. echioides* is also easily increased by making cuttings of the strong roots, which should be dibbled in pots of sandy soil, and placed in gentle heat; it is also raised from seed.

A. echioides (Echium-like).* *fl.* bright primrose yellow, with a purplish spot in the sinuses between the lobes of the corolla, which gradually disappears in a few days; spikes terminal, large, solitary, secund. May. *l.* sessile, alternate; margins—as well as the stems—ciliated. *h.* 9in. to 12in. Armenia. One of the showiest of hardy perennials for the border or rockery.

A. Griffithii (Griffith's). This differs from above in having narrower leaves, rather smaller flowers, which are of a more decided yellow, a differently shaped calyx, and a longer corolla. *h.* 9in. North-west India. Equally desirable, were it a perennial; but, being an annual, it must be constantly raised from seed.

ARNICA (from *arnakis*, lambskin; in reference to the texture of the leaves). ORD. *Compositæ.* Hardy, dwarf, herbaceous perennials, allied to *Senecio.* They thrive best in loam, peat, and sand; the plants are best divided in spring. Seeds should be procured when possible, and sown in a cold frame, in spring. The only species worth growing are described below.

A. Aronicum. A synonym of *A. scorpioides.*

A. Chamissonis (Chamisso's).* *fl.-heads* yellow, 1½in. to 2in. across, arranged in a corymb. July to September. *l.* oblong-lanceolate, acuminate or acute, tomentose, tapering to the base. *h.* 1ft. to 2ft. North America. A rather scarce, showy species.

A. Clusii (Clusius's). *fl.-heads* yellow, solitary, terminal; stalks long, thickened towards the top, and covered with long hairs. Summer. *l.* soft, radical ones entire, or nearly so, oblong, obtuse, attenuated into the petiole; cauline ones sessile, half stem-clasping, lanceolate, toothed in the lower part. *h.* 1ft. Switzerland, 1819. SYN. *Doronicum Clusii.*

A. foliosa (leafy).* *fl.-heads* pale yellow, about 1in. across, from three to seven in a corymb. August. *l.* lanceolate, stalked, acute, denticulate, smooth. *h.* 1ft. to 2ft. Stems springing from slender rhizome-like shoots. United States. Closely allied to *A. montana.* It requires a damp situation.

A. montana (mountain).* Mountain Tobacco. *fl.-heads* yellow, three or four together, about 2in. in diameter; ray florets numerous. July. *l.* radical, except a few on the scape, oblong-lanceolate, entire, smooth. Habit tufted. *h.* 1ft. Europe, 1731. A very handsome but rare plant; excellent for a rockery. It is slowly increased. See Fig. 150.

Arnica—*continued.*

FIG. 150. ARNICA MONTANA, showing Habit and Flower-head.

A. scorpioides (scorpion-like).* *fl.-heads* yellow, large, solitary; scape one to three-flowered. Summer. *l.* pale green, denticulated; radical ones on long petioles, broadly ovate; the lower stem leaves shortly stalked, amplexicaul; the upper ones sessile. *h.* 6in. to 12in. South Europe, 1710. Border. SYNS. *A. Aronicum*, *Aronicum scorpioides.*

ARNOPOGON. *See* **Urospermum.**

AROIDEÆ. *See* **Araceæ.**

ARONIA. *See* **Cratægus Aronia** and **Pyrus.**

ARONICUM. *See* **Arnica scorpioides** and **Doronicum.**

ARPOPHYLLUM (from *arpe*, a scimitar, and *phyllon*, a leaf; the leaf is sword-shaped). ORD. *Orchideæ.* Distinct evergreen epiphytes. There are about six species known, and the genus belongs to the *Epidendreæ* division of orchidaceous plants; their general characters are: Flowers small, numerous, in closely packed cylindrical spikes; anther-bed broad, shorter than the broad extension of the upper edge of the stigma; pollinia eight. Stems rather long, with white sheaths. They thrive well in fibrous peat, one-third turfy loam, freely interspersed with lumps of fresh charcoal and an abundance of crocks. When growing, a liberal supply of water at the roots is essential, as is also a situation near the light, where they will blossom much more profusely than if in any way shaded. The flowers last in perfection about four weeks.

A. cardinale (cardinal). *fl.*, sepals and petals light rose; lip deep red, on upright spikes about 1ft. high. Summer. New Grenada.

A. giganteum (gigantic).* *fl.* dark purple and rose, densely and symmetrically arranged on the cylindrical spikes, which are from 12in. to 14in. long. April and May. *l.* dark green, about 2ft. long, borne on slender pseudo-bulbs. Mexico.

A. spicatum (spike-flowered).* *fl.* dark red, on an upright spike about 1ft. long. During winter. Guatemala, 1839.

ARRACACHA (its Spanish name in South America). ORD. *Umbelliferæ.* A half-hardy tuberous perennial, highly esteemed as an esculent in South America, where it yields a food, which is prepared in the same manner as potatoes, and is said to be grateful to the palate and extremely easy of digestion. It thrives best in rich loam, and is increased by divisions of the roots.

A. esculenta (edible). *fl.* white; umbels opposite the leaves or terminal; involucre wanting. July. *l.* pinnate; leaflets broadly ovate, acuminated, deeply pinnatifid, profoundly serrated; the two lower leaflets petiolate, sub-ternate. *h.* 1ft. to 2ft. Mountainous districts of Northern South America, 1823. SYN. *Conium Arracacha.*

ARRHOSTOXYLUM. Included under **Ruellia** (which *see*).

ARROW ARUM. *See* **Peltandra virginica.**

ARROWGRASS. *See* **Triglochin.**

ARROW-HEAD. *See* **Sagittaria.**

ARROWROOT. *See* **Maranta.**

ARTABOTRYS (from *artao*, to suspend or support, and *botrys*, grapes; in reference to the way the fruit is supported by the curious tendril). ORD. *Anonaceæ*. A handsome stove evergreen shrub, thriving in a good sandy loam and peat, to which a little rotten dung may be added. Propagated by cuttings made of ripened wood, insert in sand under a bell glass, with bottom heat, in early spring. Seed, when procurable, should be sown as soon after receipt as possible.

A. odoratissimus (sweetest-scented).* *fl.* reddish brown, extremely fragrant; peduncles opposite the leaves, hooked beneath the middle. June and July. *l.* oblong-lanceolate, acuminated, smooth, shining. *h.* 6ft. Malayan Islands, 1758. In Java, the leaves are held to be invaluable as a preventive of cholera.

ARTANEMA (from *artao*, to support, and *nema*, a filament; in reference to a tooth-like process growing on the longer filaments). ORD. *Scrophularineæ*. An interesting and handsome greenhouse evergreen shrub, allied to *Torenia*. Flowers disposed in terminal racemes, and on short pedicels. Leaves opposite, sub-serrated. It may be treated as hardy during summer, for which purpose seeds should be sown in spring; but it requires the protection of a greenhouse during winter. Artanema grows freely in light rich soil, and is readily increased by cuttings and seeds.

A. fimbriatum (fringed). *fl.*, corolla blue, large, tubularly funnel-shaped, clothed with minute glandular pubescence outside; lobes unequally serrated; racemes terminal, four to sixteen-flowered. June, November. *l.* lanceolate, acute, serrated, rough to the touch from numerous elevated dots. Stem smooth, glossy. *h.* 2ft. to 3ft. New Holland (on the banks of the Brisbane River at Moreton Bay), 1830.

ARTANTHE. *See* **Piper.**

ARTEMISIA (from Artemis, one of the names of Diana). Mugwort; Southernwood; Wormwood. ORD. *Compositæ*. A very large genus of mostly hardy herbaceous perennials, few of which, comparatively speaking, are worth growing. Flower-heads disposed in spikes, or racemes, and these are usually arranged in panicles; pappus none; involucre few-flowered, ovate or rounded, imbricated; florets of the disk all tubular; of the ray, if any, slender, awl-shaped. Leaves alternate, variously lobed. All the species are of the easiest possible culture in any dry soil. The shrubby kinds are best propagated by cuttings; the herbaceous ones, by dividing at the root; and the annuals, by seeds.

A. Abrotanum (aromatic herb).* Old Man; Southernwood. *fl.-heads* yellowish. August to October. *l.*, lower ones bipinnate; upper ones pinnate, with the segments hair-like. Stem straight. *h.* 2ft. to 4ft. Europe, 1548. A deciduous shrub, well known for its fragrance. *See also* **Southernwood.**

A. A. humile (low). A low spreading variety. *h.* 1½ft.

A. A. tobolskianum (Tobolskian). A much more vigorous growing variety than the last, and larger in all its parts than the type.

A. alpina (alpine).* *fl.-heads* yellow, solitary, on long slender stalks; scales of involucre lanceolate. Summer. *l.* pinnate, covered with whitish silky hairs; lobes linear, entire. *h.* 6in. to 10in. Caucasus, 1804. Dwarf, with a very tufted habit.

A. anethifolia (Anethum-leaved). *fl.-heads* yellowish-green, small; panicle very large, densely packed, nearly 2ft. long. Autumn. *l.* chiefly cauline, much divided into thread-like segments, greyish-green. Stem shrubby at the base, nearly glabrous, branching at the top. *h.* 3ft. to 4ft. Siberia, 1816.

A. argentea (silvery).* *fl.-heads* pale yellow, roundish, closely packed. July. *l.* ovate-oblong, very freely divided, densely clothed with soft silvery hairs. *h.* 1½ft. Madeira, 1777. A very pretty species, requiring a warm sunny position on the rockery.

A. cana (hoary).* *fl.-heads* yellow, small, uninteresting, ovate, in a close spiky panicle. August. *l.* silky, hoary; lower ones wedge-shaped, sharply three-cleft; cauline ones linear-lanceolate, three-nerved. Stem ascending; branches erect. *h.* 2ft. to 3ft. North America, 1800. This is a very distinct species, and its silvery leaves and stems render it well worthy of cultivation.

A. cœrulescens (bluish).* *fl.-heads* bluish, erect, cylindrical. August. *l.* hoary, most of them lanceolate, entire, tapering at the base; lower ones variously divided. *h.* 2ft. South Europe. An ornamental evergreen shrub.

A. Dracunculus. Tarragon. *fl.-heads* whitish-green; racemes panicled; heads sub-globose. July. *l.*, radical ones three-cleft; cauline ones sessile, linear or linear-oblong, acute, entire, toothed. *h.* 2ft. South Europe, 1548. *See also* **Tarragon.**

Artemisia—*continued.*

A. frigida (frigid). *fl.-heads* yellow, uninteresting, small, roundish, racemosely panicled. August. *l.* pinnate; segments narrow, silvery. *h.* 1ft. Siberia, 1826. A pretty creeping, herbaceous plant.

A. maritima (maritime). *fl.-heads* brown; racemes oblong, erect or drooping. August and September. *l.* downy, bipinnatifid, oblong; segments linear. Britain. A much branched, erect, or decumbent plant, excellent for rough rockwork or very dry banks, &c.

A. Mutellina (Mutellina).* *fl.-heads* yellowish-green; lower ones stalked, upper ones sessile. July. *l.* all palmate, multifid, white. Stem quite simple. *h.* 6in. European Alps, 1815.

A. pontica (Pontine). *fl.-heads* yellow, roundish, stalked, nodding. September. *l.* downy beneath; cauline ones bipinnate; leaflets linear. *h.* 3ft. Austria, 1570.

A. rupestris (rock). *fl.-heads* brown, globose, stalked, nodding. August. *l.* sub-pubescent; cauline ones pinnatifid; leaflets linear, acute. *h.* 6in. Norway, &c., 1748.

A. scoparia (twiggy-branched). *fl.-heads* small, whitish; panicle broad, densely packed, about 1½ft. long. Autumn. *l.* much divided; segments hair-like; lower branches very slender. *h.* 3ft. to 5ft. East Europe.

A. spicata (spicate). *fl.-heads* brown, spicate. June and July. *l.* hoary; radical ones palmate multifid; cauline ones pinnatifid; upper linear, entire, blunt. Stem quite simple. *h.* 1ft. Switzerland, 1790.

A. Stelleriana (Steller's).* *fl.-heads* yellow, uninteresting, round, somewhat erect. Summer. *l.*, lower ones spathulate-incised; upper ones obtusely lobed; end lobes often confluent, about 2in. long, silvery white. *h.* 1ft. to 2ft. Siberia.

A. tanacetifolia (Tanacetum-leaved). *fl.-heads* brownish; racemes simple, terminal. Summer. *l.* bipinnate; lobes linear sub-lanceolate, entire, acuminated, rather downy. Stem sometimes branching at the base, herbaceous. *h.* 1½ft. Siberia, 1768.

A. vulgaris (common).* Mugwort. *fl.-heads* yellow, somewhat racemed, ovate. August. *l.* pinnatifid; segments white, and downy beneath. Stems 3ft. to 4ft. high, furrowed. Britain. The variegated form of this species exhibits a very pleasing contrast. There is also a pretty variety with golden leaves.

ARTHROPHYLLUM. A synonym of **Phyllarthron** (which *see*).

ARTHROPODIUM (from *arthron*, a joint, and *pous*, a foot; the footstalks of the flowers being jointed). ORD. *Liliaceæ*. Very pretty greenhouse herbaceous perennials, allied to *Anthericum*. Flowers purplish or white, in loose racemes. Leaves grass-like, radical. They thrive well in a compost of sandy loam and peat, and may be increased freely by divisions or seeds.

A. cirratum (curled). *fl.* white; racemes divided; bracteas leafy. May. *l.* lanceolate, ensiform, spreading, 1ft. long. *h.* 3ft. New Zealand, 1821.

A. fimbriatum (fringed). *fl.* white. July. *h.* 1½ft. New Holland, 1822.

A. neo-caledonicum (New Caledonian).* *fl.* small, white, on a much-branched, many-flowered panicle. May. *l.* tufted, linear-lanceolate, barred with black linear markings near the base. *h.* 1½ft. New Caledonia, 1877.

A. paniculatum (panicled).* *fl.* white; racemes divided; pedicels clustered; inner sepals crenulate. May. *l.* narrowly lanceolate. *h.* 3ft. New South Wales, 1800. *A. minus* is a small form of this species.

A. pendulum (pendulous).* *fl.* white, clustered in threes, pendulous. June to August. *l.* linear, keeled, shorter than the branched scape. *h.* 1½ft. New Holland, 1822.

ARTHROPTERIS. *See* **Nephrodium** and **Nephrolepis.**

ARTHROSTEMMA (from *arthron*, a joint, and *stemon*, a stamen; in reference to the stamens or connectives being jointed). ORD. *Melastomaceæ*. Beautiful stove or greenhouse evergreen shrubs. Tube of calyx turbinate or campanulate, usually clothed with bristles, pili, or scales; lobes four, lanceolate, permanent, without any appendages between them; petals four. A mixture of loam, peat, and sand, suits them best; and cuttings of small firm side shoots will root, in April or August, under a hand glass in sandy soil. Only three or four out of the half-dozen species belonging to this genus have been as yet introduced.

A. fragile (brittle). *fl.* rosy; cymes loose, terminal, few-flowered; calyx glandular. July. *l.* ovate-cordate, acute, five-nerved, serrated; branches tetragonal, beset with glandular hairs. *h.* 3ft. Mexico, 1846. Stove species.

Arthrostemma—*continued.*

A. nitida (glossy-leaved). *fl.* lilac; peduncles axillary towards the top of the branches, three-flowered, longer than the petioles. June. *l.* ovate, acute, serrulated, glabrous on both surfaces, shining above, but glandularly hispid on the nerves beneath. Stems shrubby, erect, and are, as well as the branches, tetragonally winged, beset with coloured hairs. *h.* 2ft. to 3ft. Buenos Ayres, 1829. Greenhouse species.

A. versicolor (changeable-flowered). *fl.*, petals obovate, ciliated, at first white, but at length becoming reddish, terminal, solitary. September. *l.* petiolate, ovate, serrulated, five-nerved, discoloured beneath. Plant shrubby; hairy. *h.* 1ft. Brazil (on the sea shore), 1825. Stove species.

ARTHROTAXIS. *See* **Athrotaxis.**

ARTICHOKE, GLOBE. (*Cynara Scolymus*, a cultivated form of *C. Cardunculus*). As a vegetable, the Globe Artichoke is cultivated for the use of the immature flower-heads, and is highly esteemed. A good open position, free from overhanging trees, is best suited for its culture generally, but, by planting successional suckers in different aspects, the season may be considerably prolonged. The soil must be of good depth, rich, and not too heavy. It may be greatly improved for Artichoke culture by the addition of sea-weeds or salt applied as manure.

FIG. 151. GLOBE ARTICHOKE.

Preparation of Soil. Trench the ground two spits deep if possible, mixing a liberal dressing of well-rotted manure in autumn, and ridge up for the winter, to sweeten. Crude manure full of straw, leaves, and sticks, often induce fungoid growths, and are most injurious to the crowns of the plants. Clay or stiff loam is about the worst soil on which to attempt the culture of this vegetable; this drawback may, however, to some extent be alleviated by the addition and thorough amalgamation of a light free soil or liberal dressings of sandy road drifts, or similar materials. An ill-drained soil is also fatal to good results. During hot, dry weather, the plants are greatly benefited by copious applications of clear water and dilute liquid manure; and this must be especially attended to on such soils as are liable to burn or dry up in summer.

Cultivation. When the beds have been properly prepared, the plants should be put in them in April or May. Place three together in rows between 3ft. and 4ft. apart, and about 3ft. from plant to plant. Water-in carefully to settle the soil around the roots, and apply a mulching of half-decayed manure, to prevent an undue evaporation of moisture. During hot, dry weather, give liberal supplies of water, and the plants will become established as fine stools the first season. A few heads will probably be produced the first year; but there will not be much of a crop until the second season, when five or six

Artichoke, Globe—*continued.*

good heads will be got from each plant, and for three or four years the produce will be large if the beds are properly attended to; after which time it will become desirable to make up new plantations. In October or November, it will be necessary to apply a good mulching of straw or fern to the beds, to protect the plants from frost. In April, all this litter should be cleaned off, a dressing of rotten manure applied, and the beds forked over and kept clean for the rest of the season, treating as before described. Great care must be taken to remove the heads as soon as they are in a fit state; and, when the whole of them are removed from the stems, cut the latter out as low as possible. Globe Artichokes will keep for some considerable time if laid in a cool place, although they will deteriorate in quality. These plants may be used in the background of flower borders in the kitchen garden, their handsome foliage being peculiarly well adapted for such purposes, whilst their economical value is also secured. See Fig. 151. Where there is plenty of room in light, warm sheds, orchard houses, or other places where frost can be kept out, some stools can be taken up with the root intact in the early part of November, placed in boxes of soil, and well watered-in. When drained, the boxes may be put in any of those positions for their winter quarters, and, if kept moist, will develop much earlier than the outdoor crops, provided they are planted out early in April on a warm border, and protected with mats when the weather is cold. Propagation may be effected by seeds, or by suckers from the old stools, the latter being the better plan. In the former case, sow the seeds in March, on a gentle hotbed, and prick the seedlings off singly, when large enough, into small pots. Harden off by the last week in May, and plant out in threes as previously recommended, protecting the plants from late frosts. During the growing season, give an abundance of water and liquid manure mulching, to prevent undue evaporation. In November, well cover with dry litter which will not heat; and, in hard frosts, or heavy snow, throw a few mats over the beds, uncovering at the same time as recommended above for the older plants. To propagate by rooted offsets or suckers, take up and divide the stools, when they have made a fair amount of growth in April or early in May, separating the suckers with as many roots and as much soil adhering to them as possible. The old woody portions are of little use, but they may be replanted to give off a fresh supply of suckers for the next year, if required. Propagation by suckers, if they are to be obtained, has many advantages; but care must be taken, in removing them from old plants, that some roots are attached, or growth will be uncertain. Seeds generally produce a large percentage of plants that are useless, and this is not found out until the flower-heads appear. On the other hand, suckers reproduce the parent plant, and if these are previously selected, the superior stock is thereby perpetuated.

Sorts. The Green and Purple are the best for ordinary purposes; and of these preference should be given to the former. *See also* **Cynara.**

ARTICHOKE, JERUSALEM (*Helianthus tuberosus*). A hardy tuberous-rooted herbaceous perennial, native of Brazil. The roots are used as a vegetable principally during the winter, sometimes as a dish, but more generally for flavouring purposes. Plants will grow in almost any position, but the best results and largest tubers are obtained where they receive plenty of room and liberal treatment. Their culture has been recommended as a substitute for the potato, but they are not likely to take the place of this vegetable, the flavour being disliked by many persons. A few are, however, generally acceptable.

Cultivation. To ensure the most successful results, trench over a piece of ground in autumn, and give a light dressing of manure. Fork over in March; at the

Artichoke, Jerusalem—*continued.*

same time plant good-shaped tubers (see Fig. 152) in rows about 3ft. apart, and allow from 18in. to 2ft. between the tubers in the rows. Keep clear of weeds; and, as soon as the foliage is yellow, in the latter part of the autumn, the roots will be fit for use. The best plan with this crop is to leave

FIG. 152. TUBERS OF JERUSALEM ARTICHOKE.

it in the ground till wanted, or till the end of February, and then to take up every tuber, replanting those which are wanted for stock, and storing the others away in a cold dry place. When they commence growth, they turn black, and are of little use for cooking, save for flavouring soups. This vegetable has of late years grown into favour as a marketable crop, and the demand seems to be increasing. Considering its very easy culture, it is fairly remunerative. *See also* **Helianthus.**

ARTICULATE, ARTICULATED. Jointed; having joints.

ARTILLERY PLANT. *See* **Pilea microphylla.**

ARTOCARPEÆ. A tribe of the large order *Urticaceæ.*

ARTOCARPUS (from *artos*, bread, and *carpos*, fruit; the fruit, when baked, resembling bread). Bread Fruit. SYNS. *Polyphema, Rademachia, Rima.* ORD. *Urticaceæ.* TRIBE *Artocarpeæ.* Included in this most remarkable tribe, in addition to the Bread-fruit Tree, are the virulent poisonous *Antiaris toxicaria* and the economic Cow Tree (*Brosimum Galactodendron*) of Caraccas. A genus of stove evergreen trees, requiring a high and very moist atmosphere, a copious supply of water, perfect drainage, and a compost of two parts rich loam and one of leaf mould, with the addition of a little silver sand. Under all conditions, this genus is difficult to propagate; the young and slender lateral growths are adapted for cuttings; and suckers may be utilised when procurable, which is very rare.

A. Cannoni (Cannon's).* *l.* alternate, petiolate; petiole and midrib bright red; upper surface glossy, of a rich, full bronzy crimson hue, beautifully tinted with purple; under surface bright vinous red. The leaves vary much in form; some are simple and cordate at the base, with the apex irregularly lobate; some have the apex regularly three-lobed, with short, entire lobes; and others, again, are deep three-lobed, being divided nearly to the base, the segments, of which the centre one is largest, being slightly sinuate-lobed. *h.* 7ft. Society Islands, 1877. This is a most distinct and handsome ornamental-leaved plant.

A. incisa (incised).* True Bread Fruit. *l.* from 2ft. to 3ft. long, deeply lobed or incised, deep green on the upper side, paler below. *h.* 50ft. South Sea Islands, 1793. This is a noble tree when full grown, and forms a most distinct and beautiful stove plant. The extraordinary fruit is produced from the axils of the leaves in large globular heads, and is highly valued as an article of food in its native country.

A. integrifolia (entire-leaved). *l.* oblong, undivided, sinuated, scabrous, downy beneath. *h.* 30ft. India, 1778.

A. laciniata metallica (laciniate, metallic). *l.* bronzy above, reddish purple beneath. Polynesia.

ARUM (formerly *Aron*; probably of Egyptian extraction). ORD. *Aroideæ* (*Araceæ*). A genus of ornamental or curious, hardy, greenhouse, or stove perennials, with thick rhizomes and pedate or hastate leaves. Spathe large, convolute; spadix naked and club-shaped at the top. They are all of easy culture, and the indoor species will thrive with such treatment as is given to Alocasias, Caladiums, &c. Rich soil is one of the first conditions of success. Like most plants grown for the beauty of

FIG. 153. ARUM MACULATUM.

their foliage, rapid and free growth is necessary. A compost of good rich loam, with a third of sweet manure, thoroughly rotted, or leaf mould, with some sharp sand, is very suitable. Plenty of moisture is necessary during

Arum—*continued.*

the growing season, after which the tender kinds should be kept moderately dry, warm, and at rest during the winter. The hardy kinds may be left in the ground. Propagated by seeds or division of the roots—usually the latter. The best time to divide them is just as they commence their new growth, securing as many roots as possible to each division. Any rootless pieces should be placed in heat shortly after removal; this hastens the formation of roots and excites top growth. Arums are useful in sub-tropical gardening, and are otherwise interesting plants both for indoors and outside cultivation; and the hardy kinds are very suitable for naturalising in woodlands, &c. There are many other species besides those here described, but the following list comprises the best. Sub-sections of the genus will be found treated separately, such as **Amorphophallus** (which *see*), &c.

FIG. 154. ARUM DRACUNCULUS.

A. bulbosum (bulbous). Synonymous with *A. ternatum.*

A. Dracontium (Green Dragon). *fl.*, spadix subulate, longer than the oblong convolute green spathe. June. *l.* pedate, entire. *h.* 2ft. North America, 1759. Hardy.

A. Dracunculus (Common Dragon).* *fl.*, spadix lanceolate, shorter than the ovate, flat, smooth, brown spathe. July. *l.* pedate, entire. *h.* 3ft. South Europe, 1548. Hardy. SYN. *Dracunculus vulgaris.* See Fig. 154.

A. indicum (Indian). *See* **Colocasia indica.**

A. italicum (Italian).* *fl.*, spathe ventricose below, opening nearly flat and very broad above; apex often falling over very shortly after expansion, sometimes greenish yellow, at others nearly white; spadix yellowish or creamy white, club-shaped, about one-third as long as the spathe. Spring. *l.* appearing before winter, radical, triangular-hastate. *h.* 9in. to 2ft. Channel Islands and Cornwall, &c. Hardy.

A. i. marmorata (marbled).* *l.* marbled with yellow. A very pretty and effective hardy border plant.

A. maculatum (spotted). Lords and Ladies; Cuckoo Pint. *fl.*, spathe ventricose below and above, constricted in the middle, with inflexed edges when open, spotted with dull purple; spadix usually purple, shorter than the spathe. Spring. *l.* vernal radical, hastate-sagittate, with deflexed lobes. *h.* 9in. Britain, &c. This species is admirably adapted for a corner in the wild garden. See Fig. 153.

A. Malyi (Maly's). *fl.* whitish. Montenegro, 1860.

A. Nickelli (Nickel's). Levant, 1859. A form of *A. italicum.*

A. orientale (eastern). *fl.* resembling those of *A. maculatum.* June. *l.* brownish, simple, ovate, slightly sagittate. *h.* 1ft. Tauria, 1820. Hardy.

A. palæstinum (Palestine).* *fl.*, spathe 7in. to 11in. long, purplish blotched or spotted outside, rich velvety black inside and yellowish white at the base of the tube; spadix much shorter than the spathe; petiole usually rising 8in. or 9in. above the leaves. May. *l.* four or five, triangular-hastate, acute, from 6in. to 14in. long, and from 3½in. to 7½in. broad; petioles 12in. to 18in. long. Jerusalem, 1864. Tender.

A. pictum (painted). *h.* 2ft. Corsica, 1801. Hardy.

A. proboscideum (proboscis-like).* *fl.*, spathe greenish purple, navicular, horizontal, terminated by a straight tail; scapes arising from among the petioles. May. *l.* radical, about four, cordate-elliptic, entire. *h.* 6in. South Europe, 1823. Hardy.

A. spectabile (showy). *fl.*, spathe ovate-oblong, acuminate, dark purplish inside, longer than the purplish spadix. *l.* broadly hastate-sagittate. *h.* 1ft. Asia Minor. Half-hardy.

A. spirale (spiral). *fl.*, spadix lanceolate, shorter than the oblong-lanceolate spirally twisted brown spathe. May. *l.* linear-lanceolate. Plant stemless. *h.* 1ft. China, 1816. Tender.

A. tenuifolium (narrow-leaved).* *fl.*, spadix subulate, longer than the white lanceolate spathe. April. *l.* linear-lanceolate. Plant stemless. *h.* 1ft. South Europe, 1570. Hardy.

A. ternatum (three-leafleted). A synonym of *Pinellia tuberifera.*

A. variolatum (variegated). Dalmatia, 1859. Hardy.

A. venosum (veined). A synonym of *Sauromatum guttatum.*

A. Zelebori (Zelebor's). A form of *A. maculatum.*

ARUM LILY. *See* **Richardia africana.**

ARUNDINARIA (altered from *arundo*, a reed). ORD. *Gramineæ.* A small genus of hardy or nearly hardy shrubby grasses, having strong jointed stems, and frequently included under *Bambusa.* For sub-tropical gardening purposes more particularly it is exceedingly ornamental as an isolated tuft. It thrives best in a deep, rich soil, and requires plenty of water when in a growing state. Increased by division of the roots.

FIG. 155. ARUNDINARIA FALCATA.

A. falcata (sickle-shaped).* *l.* linear-lanceolate, very acute, shortly stalked, very light green. Stems freely branched, deep green, and very slender. *h.* 3ft. to 6ft. India. An extremely handsome species for greenhouse decoration; also for outdoor work, particularly in the South of England, &c. SYN. *Bambusa gracilis*, of gardens.

A. Maximowiczii (Maximowicz's). This Japanese species is believed to be allied to, if not identical with, *Bambusa Simonii.* Quite hardy.

A. Metake (Metake). *l.* lanceolate, with very sharp points, dark green, persistent, narrowed into a short leafstalk, 6in. to 12in. long; sheath ample. *h.* 4ft. to 6ft. Japan. A handsome, hardy, dwarf, much-branched species, forming grand specimens, and producing flowers very freely. SYN. *Bambusa japonica.*

ARUNDO (origin of word doubtful; stated by some authorities to be from *arundo*, a reed; and others as from the Celtic *arn*, signifying water). Reed. ORD. *Gramineæ.* A very ornamental group of half or quite hardy plants, of very easy culture in ordinary garden soil, preferring damp situations. Panicle loose; calyx two-valved, unequal, many-flowered; corolla of two very unequal valves; all, except the lower and imperfect one, surrounded by a tuft of hairs. Fruit free, covered by the corolla. Arundos are very valuable either for conservatory decoration, sub-tropical gardening, or cultivation in clumps on the turf of the flower-garden or pleasure ground, and the margins of lakes. Although well worth growing, all are inferior to their ally, the Pampas Grass. Propagated by seeds or divisions, the spring being the best time to adopt either method of increase.

A. conspicua (conspicuous).* *fl.* silky-white, on large drooping racemes, and lasting in beauty for several months. *h.* 3ft. to 8ft., but in a good deep and sandy loam it sometimes attains the height of 12ft. New Zealand, 1843. This fine species grows in dense tufts, from which arise numerous leathery, narrow, smooth (or slightly rough), long curving leaves, and erect, slender culms. The plant is not sufficiently hardy to withstand a severe winter, and should, therefore, be protected with mats, or be grown in tubs, so that it can be removed under shelter before the approach of winter. These precautions are unnecessary in the more southern counties of England.

A. Donax (Donax).* Great Reed. *fl.* reddish, ultimately whitish, in numerous spikelets, forming a large compact panicle 12in. to 16in. long. Autumn. *l.* alternate, lanceolate-acute, large, and ornamental, glaucous green, arching. *h.* about 12ft. South Europe, 1648. This also requires protection during winter in the colder counties. See Fig. 156.

A. D. versicolor (various coloured).* *h.* 3ft. South Europe. Although much smaller, this variety is far superior to the type for gardening purposes, and has its leaves ribboned with white. It requires a deep, well drained, sandy loam to thrive well, and a thorough winter protection of cocoa-fibre refuse or coal ashes. For isolated tufts or groups, few plants can equal it. It is propagated by placing a stem in water, which induces little rooted plants to start from the joints; these should be separated, potted off, and kept in frames until thoroughly established.

A. mauritanica (Mediterranean Reed). This is a rare greenhouse species, closely allied to *A. Donax*, but inferior to it.

FIG. 156. ARUNDO DONAX.

ARYTERA. A synonym of **Ratonia** (which *see*).

ASAFŒTIDA. *See* **Narthex Asafœtida.**

ASARABACCA. *See* **Asarum europæum.**

ASARUM (from *a*, not, and *saron*, feminine; derivation doubtful). ORD. *Aristolochiaceæ*. Curious hardy herbaceous perennials, with bell-shaped, three-cleft perianths. They should be planted at the foot of the rockery, or in borders or woodlands, as they are not very showy, but are, nevertheless, worth growing, and easily propagated by divisions, in spring.

A. canadense (Canadian).* *fl.* brown, campanulate, on a short peduncle, sometimes nearly buried. May and June. *l.* in pairs, broadly reniform. *h.* 1ft. Canada, &c., 1713.

FIG. 157. ASARUM CAUDATUM.

Asarum—*continued.*

A. caudatum (tailed).* *fl.* brownish-red, with attenuated or caudate calyx lobes. July. *l.* cordate-reniform, hooded, sub-acute, or bluntish, slightly pubescent. California, 1880. A rare and pretty species. See Fig. 157.

A. europæum (European).* Asarabacca. *fl.* dull brown, solitary, rather large, drooping; segments of perianth incurved. May. *l.* two on each stem, roundish-reniform, stalked, slightly waved. *h.* 1ft. England.

ASCENDING. Directed upwards; as the stem, which is the ascending axis.

ASCLEPIADEÆ. A large order of, for the most part, lactescent, climbing shrubs. Flowers sub-umbellate, fascicled or racemose, interpetiolar; pollen collected in the form of waxy masses, coalescing to the cells of the anthers; follicles two, one of which is abortive. Leaves entire, usually opposite.

ASCLEPIAS (the Greek name of Æsculapius of the Latins). Swallow-wort. ORD. *Asclepiadeæ*. Erect, hardy, herbaceous or sub-shrubby perennials, except where otherwise specified. Corolla five-parted, reflexed; umbels interpetiolar; corona seated on the upper part of the tube of the filaments, five-leaved. Leaves opposite, verticillate, sometimes alternate. Most of the hardy species are very handsome border plants, thriving in peaty, or light rich soil, and are increased by dividing the roots in spring, and sometimes also by seeds. The doubtfully hardy or rarer species should always be grown in a peat soil, and have a little protection during severe frost, by mulching the roots. The most important of the greenhouse and stove species is *A. curassavica*. In order to obtain good bushy specimens of this, it will be necessary to cut the plants back annually, after keeping them slightly dry, and resting for a month or two in midwinter. When growth has sufficiently advanced, they should be shaken out and repotted. At this stage, a close, moist atmosphere will be needful to produce the usually very free growth. The points of the shoots must be nipped out, in order to promote a bushy habit. When the pots have become filled with roots, liquid manure may be applied; but it must be quite clear and not over strong. All the indoor species grow best in good fibry loam and leaf mould, and require to be potted firmly. Cuttings should be secured in spring, struck in gentle heat, under a bell glass, and as soon as they are well rooted, potted into 60-size pots. A shift must be given as often as the pots become filled with roots, up to the time when the plant commences flowering. Seeds may be sown in pots in spring, pricked out singly when large enough, and then treated similarly to cuttings.

A. acuminata (taper-pointed).* *fl.* red and white; umbels lateral, solitary, erect. July. *l.* ovate, sub-cordate, acuminated, on short petioles; superior ones sessile, glabrous, but rough on the edges. Stems erect, glabrous, simple. *h.* 2ft. New Jersey, 1826. Hardy, herbaceous.

A. amœna (pleasing).* *fl.* beautiful purple; umbels terminal, erect; appendages of corona exserted, red. July. *l.* opposite, almost sessile, oblong-oval, downy beneath, with a large purple middle nerve. Stem simple, with two rows of down. *h.* 2ft. to 3ft. New England, 1732. Hardy, herbaceous.

A. Cornuti (Cornuti's).* Synonymous with *A. syriaca*.

A. curassavica (Curassavian). Redhead. *fl.* reddish orange-scarlet; umbels erect, solitary, lateral. July to September. *l.* opposite, oblong-lanceolate, tapering at both ends. Stem rather downy, simple, seldom a little branched. *h.* 1ft. to 3ft. Tropical America, 1692. The white-flowered variety is a very pretty contrast. Stove herbaceous.

A. Douglasii (Douglas's).* *fl.* large, waxy, purplish-lilac, sweet-scented, in many-flowered umbels. Summer. *l.* opposite, ovate-cordate, acuminated, 6½in. long by 5in. or more wide, glabrous above, downy beneath. Stem thick, woolly, simple. *h.* 2ft. to 3ft. West America, 1846.

A. hybrida (hybrid). A synonym of *A. purpurascens*.

A. incarnata (flesh-coloured).* *fl.* red or purplish; umbels numerous, usually twin. July. *l.* opposite, lanceolate, rather woolly on both surfaces. Stem erect, branched and tomentose at the top. *h.* 2ft. Canada (on the banks of rivers), 1710. Hardy, herbaceous.

A. mexicana (Mexican). *fl.* white; umbels many-flowered. July. *l.* verticillate, linear-lanceolate, with revolute edges;

Asclepias—*continued.*

lower ones four to six in a whorl; upper ones three in a whorl, or opposite. *h.* 2ft. to 3ft. Mexico, 1821. Greenhouse evergreen.

A. phytolaccoides (Phytolacca-like). *fl.* purple; corona white, with truncate leaflets; umbels lateral and terminal, solitary, on long peduncles, drooping. July. *l.* broad, ovate-oblong, acute, glabrous, paler beneath. Stem erect, simple, spotted with purple. *h.* 3ft. to 4ft. Virginia and Carolina (on the mountains), 1812.

A. purpurascens (purplish). *fl.* purple; umbels erect. July. *l.* opposite, large, ovate, with a purplish middle nerve, villous beneath. Stem simple, rather hairy at top, brownish green at bottom. *h.* 2ft. to 3ft. Virginia (in shady swamps), 1732. Hardy. SYN. *A. hybrida.*

A. quadrifolia (four-leaved).* *fl.* white, small, sweet-scented, with red nectaries; umbels twin, terminal, loose-flowered; pedicels filiform. July. *l.* ovate, acuminated, petiolate; those in the middle of the stem larger, and four in a whorl; the rest opposite. Stems erect, simple, glabrous. *h.* 1ft. New York, 1820. Hardy species.

A. rubra (red). *fl.* red; umbels compound. July, August. *l.* alternate, ovate, acuminated. Stem erect, simple. *h.* 1ft. to 2ft. Virginia, 1825.

A. Sullivanti (Sullivant's). Similar to *A. syriaca*, but having larger and deeper coloured flowers.

A. syriaca (Syrian).* *fl.* pale purple, sweet scented, in large, loose, drooping umbels. July. *l.* opposite, lanceolate-oblong, or oval, gradually acute, tomentose beneath. Stems simple. *h.* 3ft. to 5ft. North America, 1629. SYN. *A. Cornuti.*

Ascyrum—*continued.*

Hypericum. They require to be protected during winter by a frame; for this purpose they should be grown in pots, as they never exist long in the open border. A compost of peat, pure leaf soil, and sand, in equal portions, suits them well; young cuttings of the shrubby kinds will root in sand under a hand bell glass. Propagated by careful divisions of the roots in spring. All may be raised from seeds.

A. amplexicaule (stem-clasping). *fl.* yellow, few, axillary, and terminal; corymbs naked. July. *l.* stem-clasping, ovate, cordate, sinuately-curled. Stem dichotomously panicled. *h.* 2ft. North America, 1823. The flowers and leaves are longer in this than in any other of the species.

A. Crux Andreæ.* St. Andrew's Cross. *fl.*, petals narrow-pale yellow, nearly sessile, in terminal corymbs. July. *l.* ovate-linear, obtuse, usually in bundles in the axils. Stem shrubby, round. *h.* 1ft. North America (in sandy fields), 1759. This proves to be quite hardy in many situations.

A. hypericoides (Hypericum-like). *fl.* yellow. August. *l.* linear-oblong, obtuse. *h.* 2ft. North America, 1759.

A. stans (standing). St. Peter's Wort. *fl.* yellow. August. *l.* oval or oblong, somewhat clasping. *h.* 2ft. North America, 1816.

ASHES. The earthy or mineral particles of combustible substances, remaining after combustion. Ashes are amongst the most economical manures.

Vegetable Ashes are generally the best application for manuring boggy, cold, and, consequently, sour and unprofitable land, in quantities of about forty bushels per acre, thinly and evenly distributed. The annual exhaustion of salts from large crops of grain, roots, and grass, is from 180lb. to more than 250lb. per acre; and the aggregate of a few years will so far impoverish the soil in one or more of the principles necessary to sustain a luxuriant vegetation, that it will cease to yield remunerating returns. The ashes of vegetables consist of such elements as are always required for their perfect maturity, and it is evident they must furnish one of the best saline manures which can be supplied for their growth; they contain, in fact, every element, and generally in the right proportions, for insuring a full and rapid growth. Both gardener and farmer will therefore perceive the great value of Ashes to their crops.

Coal Ashes. The bituminous and anthracite coals afford Ashes, and, although inferior in quality to those made from wood and vegetables, are, like them, a valuable manure, and they should be applied to the land in a similar manner. If they contain many cinders, from not having been thoroughly

FIG. 158. FLOWERING BRANCH OF ASCLEPIAS TUBEROSA.

A. tuberosa (tuberous).* *fl.* bright orange, very showy; umbels disposed in a terminal sub-corymb. July to September. *l.* scattered, oblong-lanceolate, hairy. Stems erectish, divaricately branched at top, very hairy. *h.* 1ft. to 2ft. North America (in stony, sandy fields and woods), 1690. A desirable hardy herbaceous border plant. See Fig. 158.

A. variegata (variegated). *fl.*, petals and foliola of corona white, fructification red, in dense umbels, very handsome; umbels almost sessile; pedicels hairy. July. *l.* opposite, ovate, petiolate, wrinkled, naked. Stems simple, erect, variegated with purple. *h.* 3ft. to 4ft. New York to Carolina (on dry, sandy hills), 1597.

A. verticillata (whorled). *fl.*, corolla with yellowish green petals and white nectaries; umbels many-flowered. July and August. *l.* very narrow, linear, thick, quite glabrous, usually verticillate, but sometimes scattered. Stems erect, often branched, having a downy line on one side. *h.* 1ft. to 2ft. New Jersey, 1759.

ASCYRON. *See* **Hypericum Ascyron.**

ASCYRUM (from *a*, without, and *skyros*, hard; that is to say, a plant which is soft to the touch). ORD. *Hypericinæ.* A genus of elegant little herbs and sub-shrubs, with sessile, entire leaves, destitute of pellucid dots, but usually furnished with black dots beneath. Flowers resembling

Ashes—*continued.*

burned, they are more suited to heavy than to light soils. Coal Ashes, if very fine, may be sprinkled half an inch deep on the surface, over peas and beans, &c., to preserve them from mice; they may also be used for garden and greenhouse walks, where bricks or tiles are absent, being tidy in appearance, and an excellent substitute for other and more expensive material.

Peat Ashes. Peat approaching to purity, when thrown out of its bed and thoroughly dried, may be burned to an imperfect Ash, and when it does not reach this point, it will become thoroughly charred, and reduced to cinders. The process of burning should be as slow as possible. In either form, it is a valuable dressing for the soil.

ASH-TREE. *See* **Fraxinus.**

ASIATIC POISON BULB. *See* **Crinum asiaticum.**

ASIMINA (meaning unknown). ORD. *Anonaceæ.* Hardy shrubs, with oblong, cuneated, usually deciduous leaves. Flowers sometimes rising before the leaves, usually solitary and axillary. They thrive freely in a mixture of sand and peat. Propagated by layers put down in the autumn, or by seed, procured from their native country. Seedlings should be raised in pots, and sheltered in winter, until they have acquired a considerable size.

FIG. 159. FLOWERING BRANCH OF ASIMINA TRILOBA.

A. triloba (three-lobed).* *fl.* campanulate, the three outer petals pale purplish, and the three inner ones smaller, purplish on the outside as well as the inside at the base and apex, with the middle yellow, about 2in. diameter, produced between the upper leaves. May. *l.* oblong-cuneated, often acuminated, and, as well as the branches, smoothish. *h.* 10ft. Pennsylvania, 1736. A small tree or shrub. See Fig. 159.

ASKALLON (the Eschallot). *See* **Allium ascalonicum.**

ASPALATHUS (from *a*, not, and *spao*, to extract; in reference to the difficulty of extracting its thorns from a wound). Including *Sarcophyllus.* ORD. *Leguminosæ.* Shrubs or sub-shrubs, natives, with one exception, of the Cape of Good Hope. Flowers usually yellow, furnished with three bracteoles, or a leaf comprised of three leaflets. Leaves of three to five leaflets, disposed palmately, rarely pinnately, having scarcely any or very short petioles.

Aspalathus—*continued.*

All the species are pretty when in flower, and thrive in a mixture of loam, peat, and sand. Young cuttings of half-ripened wood will strike in April, in sand, under bell glasses, which must be wiped dry occasionally. But little water is needed. Over a hundred species are known; those introduced are very rarely seen in cultivation.

ASPARAGUS (from *a*, intensive, and *sparasso*, to tear; in reference to the strong prickles of some species). ORD. *Liliaceæ.* Erect or climbing herbs or shrubs, with very small scale-like leaves, and a profusion of numerous slender fascicled-needle, rather spiny branchlets. Flowers axillary, inconspicuous. Fruit baccate. The indoor species will all thrive well in a warm greenhouse temperature, provided they have partial shade, a good supply of moisture at the roots, and are not kept too close, in a moderately rich sandy compost. The hardy species are propagated chiefly by seeds and divisions of the roots. Rich sandy loam is necessary, and otherwise they may be treated as ordinary perennials. Some of the species belonging to this genus are among the most elegant of foliage plants for cutting purposes. *A. decumbens* and *A. scandens* make excellent plants for Wardian cases, and may be cut in freely if they exceed their limits.

ASPARAGUS (*A. officinalis*) AS A VEGETABLE. The value and importance of this plant as a vegetable cannot be over-estimated; it is extensively grown, and, when properly managed, produces a fairly lucrative crop.

Soil and Bed. The first thing to be done in the preparation of an Asparagus bed to stand for any length of time, is to secure an efficient drainage; and on wet soils this is best effected by placing a layer of brick rubbish over the whole of the bottom, and connecting this with a drain. On gravelly or other soils which are drained naturally, of course, this is not needed; but if really good crops are a *desideratum*, water should not stand within 3ft. of the surface. In all cases, the ground must be dug to a depth of 18in., and, if stiff, a goodly amount of road sweepings, or other gritty materials, should be well mixed with the staple soil. Asparagus requires a good soil, neither too heavy nor too light.

Manuring. After the soil has been well trenched, and has lain long enough to settle down, a good dressing of manure—thoroughly rotted, and not too rank, at the rate of from twenty to thirty tons to the acre, dug into the surface of the beds—will be found very beneficial. If possible, this should be introduced in January; and then, if the weather permits, the beds should be forked two or three times by the end of March, so as to render the soil as friable as possible. A very good manure, and one that is easily obtained, is common garden salt. This may be given annually to established beds. A moderate dressing should be applied just before growth commences in spring, but a little will do no harm at other times during the summer. It is best scattered on with the hand, and a showery day should be selected, as it will then soon disappear. Salt, besides acting as a manure, has also the properties of keeping the beds cool and moist in hot weather, and of preventing the growth of weeds.

Planting. Asparagus can be planted during March and April, the latter month being the best time for the work. The soil having been thoroughly prepared, the next point is to decide on the size of the beds; this

Asparagus—*continued.*

depends on the size of garden, and the class of "grass" desired. When very large and fine stocks are the object in view, the best results will accrue if the plants are fully a yard apart each way; but this means a comparatively small crop. A good plan is to make the beds 3ft. wide, planting two rows, at a distance of 1ft. from each other, and allowing 18in. between each plant, placing them in alternate order. An 18in. alley should be allowed between the beds. The roots used for making the beds should be one year old, and fresh from the ground. In planting, pull out a wide drill with a hoe, or other tool, to the depth of about 3in. or 4in., and spread out the roots all round. Carefully shake the soil in amongst the roots, and, if dry, apply some water through a coarse-rosed watering pot, to settle the earth around them. At intervals, as necessary, give other waterings till September, when they should be discontinued. At all times, keep the beds free from weeds, removing them by the hand to prevent injury to the crowns of the plants. If the ground is good, no liquid manure will be needed the first year. As soon as the foliage turns yellow, cut it off, cleanly rake over the beds, and leave till about January, when a top-dressing of from 1in. to 3in. of thoroughly rotted manure may be applied with advantage. At the end of February, rake off the bed all loose straw or

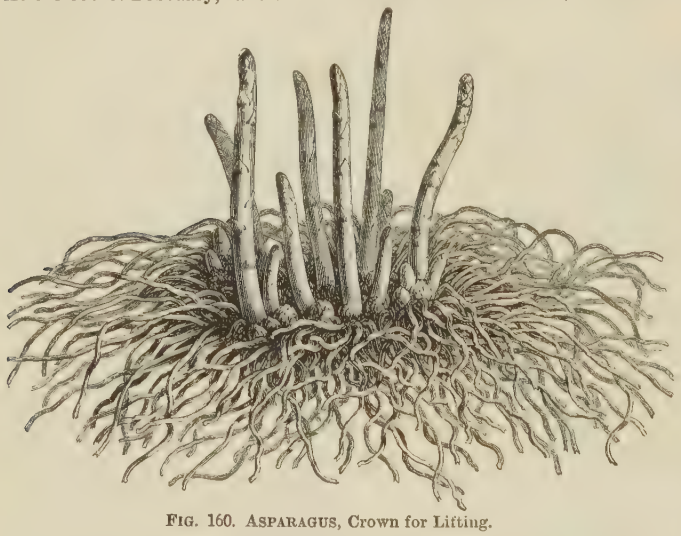


FIG. 160. ASPARAGUS, Crown for Lifting.

other *debris*, and throw on them a little of the soil from the alleys, raking down, and finishing off the edges squarely and neatly. During this and succeeding years, apply liquid manure and clear water, from time to time, as required; and, provided the manure is not of too great strength, there is scarcely any limit to its application; but, in many instances, beds which have only received an annual dressing have given a good return. Each year they must be cut over and dressed as before described, but care must be taken to keep them flat on the surface, otherwise the plants will die out for want of moisture. When the produce appears, the beds should be kept cut over until the 20th of June, after which, cutting should cease, or they will be rendered comparatively unproductive. Cutting can commence the second or third year, or as soon as there is any "grass" worth taking. Several methods of growing these plants could be cited, but that which we have recommended will be found most satisfactory.

Seeds. Plants are raised by sowing seeds in rows across the kitchen garden, or selected quarter, about the month of April. The seedlings make a growth, and form good plants during the first season. In March or April of the following year, or the year after, they may be removed, and planted

Asparagus—*continued.*

out permanently, as already alluded to. Many cultivators prefer growing their own plants from seed; because during the transit of the roots from any distance to where they are to be grown, a frequent and injurious exhaustion takes place, and particularly so when they are carelessly packed.

Forcing. Asparagus can, if properly treated, be obtained from December onwards; and at Christmas time the produce is very valuable; but, in order to obtain it at this season, it will be necessary to resort to forcing. Prepare some beds to secure a lasting heat, and on these place about 3in. of ordinary garden soil, not very stiff. Then take the roots, and place them crown upwards, and moderately close together, shaking the soil well amongst the roots, and covering about a couple of inches deep. Water well, to settle the whole, and put on the lights, allowing a little ventilation, to let out any steam which may arise. Unless the weather be very cold indeed, give a little air at all times, and only cover the lights in actual frost. From time to time, apply fresh linings of hot manure, and in cold rains, or wind, cover the outsides of the frames with old sacks, or other things which will keep in the heat. A regular and steady temperature of 60deg. will force this plant with better results than a higher one. Houses that are fitted with hot-water pipes to give bottom heat can be used equally as well as manure beds, and so long as the soil is kept moist, the heat thus obtained is as good as any for the purpose, and much less trouble than fermenting materials. To keep up a regular supply, a succession of beds will be necessary. Asparagus can be forced, or rather forwarded, in pots or boxes, in a warm greenhouse or vinery, and, of course, when the plants are done with, they can be cast away. We give an illustration (Fig. 160) of a bearing crown fit for gentle forcing; but, of course, it must not be left so bare of earth as appears here, which is done for the purpose of clearness.

Varieties. Counover's Colossal, and Giant, are the most esteemed. Strains are frequently largely advertised as improvements on the sorts above-mentioned, and the charges are higher accordingly. The difference may be generally attributed to the culture the plants receive more than to an improved variety. When saving seed for home sowing, they should be taken from the strongest growths, or deterioration will ensue.

A. æthiopicus ternifolius (ternate). *fl.* white, in shortly-stalked racemes, very profuse. August. *l.*, false ones in threes, flattened, narrow, linear; prickles solitary, reversed; branches angular. *h.* 30ft. South Africa, 1872. A greenhouse evergreen.

A. Broussoneti (Broussonet's).* *fl.* very small, succeeded by small red berries. May. *l.*, lower ones solitary, the others ternate, 1in. long, needle-shaped, persistent, distant, glaucescent; stipules with reflected spines at the base. Summer. Stem tapering, streaked, shrubby. *h.* 10ft. Canary Islands, 1822. A very pretty hardy climber.

A. Cooperi (Cooper's). *fl.* axillary, one to three, from the same nodes as the false leaves; perianth cream-coloured, one line long. April and May. *l.* minute, deltoid, scariose, reddish-brown; false leaves six to fifteen to a node, subulate, moderately firm, ¼in. to ⅝in. long, spreading or ascending. *h.* 10ft. to 12ft. Africa, 1862. A greenhouse climber, with a shrubby terete main stem, 1½in. to 2in. thick at the base, sending out crowds of spreading branches, which bear abundant slender, firm, alternate branchlets; nodes of branches and branchlets, furnished with distinct red-brown, subulate prickles, those of the main stems ¼in. long, deflexed, but not curved.

A. decumbens (decumbent).* Stem unarmed, decumbent, much branched; branches wavy; leaves setaceous, in threes. Cape of Good Hope, 1792. A greenhouse evergreen herbaceous perennial.

A. falcatus (hooked-leaved). *l.* fascicled, linear, falcate; branches round; prickles solitary, recurved; peduncles one-flowered, clustered. *h.* 3ft. India, 1792. A greenhouse evergreen perennial.

A. officinalis (officinal). Common Asparagus. *fl.* greenish-white, drooping. August. *l.* setaceous, fasciculate, flexible,

Asparagus—*continued.*

unarmed. Stem herbaceous, mostly erect, rounded, very much branched. *h.* 1ft. Said to grow on "Asparagus Island," Kynance Cove, Lizard, but we have never found it there, and it has probably long since been exterminated.

A. plumosus (plumed).* *fl.* white, small, produced from the tips of the branchlets. Spring. *l.*, true ones in the form of minute deltoid scales, with an acute ultimately reflexed point; the false ones are grouped in tufts, each being ⅛in. to ¼in. long, bristle-shaped, and finely pointed. South Africa, 1876. An elegant evergreen climber, with smooth stems and numerous spreading branches. It forms an excellent plant when trained in pots, and is invaluable for cutting.

A. p. nanus (dwarf).* A very elegant dwarf variety of above. Stems tufted, slender, and gracefully arching. South Africa, 1880. For bouquets, the cut sprays of both type and variety have the advantage of much greater persistency than any fern, retaining their freshness in water from three to four weeks. See Fig. 161, for which we are indebted to Messrs. Veitch and Sons.

A. racemosus (racemose). *fl.* greenish-white, in many-flowered axillary racemes. May. *l.* bundled, linear-subulate, falcate; branches striated; prickles solitary. *h.* 3ft. India, 1808. Greenhouse evergreen shrub.

FIG. 161. ASPARAGUS PLUMOSUS NANUS.

A. ramosissimus (very branching). *fl.* solitary, at the tips of the branchlets; pedicels hardly perpendicular, one and a-half to two lines long; cream coloured. June. *l.* obscurely spurred at the base; false leaves three to eight-nate, flattened; linear-falcate acute, ⅛in. to ⅜in. long, spreading. South Africa, 1862. A wide climbing, copiously branched, slender greenhouse shrub, with very numerous spreading or ascending branches and branchlets.

A. scandens (climbing).* *fl.* whitish, axillary on the ultimate branchlets, succeeded by round orange-coloured berries. The annual, much-branched, unarmed stems bear, usually in threes, numerous small linear-pointed leaves, which on the ultimate branches spread nearly in one plane. Cape of Good Hope, 1795. An elegant climbing greenhouse perennial.

A. virgatus (twiggy).* A remarkably elegant feathery-looking plant, of shrubby habit. The stems, which issue from the crown of the stout fleshy roots, are of a dark green colour, and bear at the upper end a corymbose head of erect branches, of which the lowest is the youngest or most recently developed. These branches are again twice branched, the ultimate branchlets being furnished with needle-shaped false leaves, ¼in. long, which usually grow in threes. South Africa, 1862.

ASPARAGUS BEETLE (*Crioceris asparagi*), or "Cross-bearer." This beautiful little insect is blue-black or greenish; the thorax is red with two black spots, and the wing-cases are yellow, with a black cross on them; the legs and antennæ are black. The short grey larva is flat underneath, arched on the back, and covered with hairs. The sides are of an olive hue, and the little legs and head are black. It ejects a drop of blackish

Asparagus Beetle—*continued.*

fluid from the mouth when touched. When full grown, which takes about a fortnight, the larva measures about two lines in length; the average length of the perfect Beetle is about three lines. Although this insect does not actually destroy the plants, it inflicts much damage on the foliage, and checks the growth of the stems after they have attained some size, in consequence of which the foliage becomes much less in the next season. The eggs are fixed to the shoots, and are small, dark, pointed bodies. The larvæ do the harm, as they feed on the bark and tender portions of the plants. The mature Beetles should be picked off by hand, and, by commencing early enough in the season, their numbers will be greatly reduced. Syringing the plants with water, heated to a temperature that will not injure the plants, is found a useful method for removing the grubs.

White Hellebore. Freshly-ground White Hellebore, sprinkled over the foliage while it is damp, and repeating the operation at intervals of about eight days for a season, will generally effect a riddance; but the following will usually be found better in such cases. Neither must be applied until after cutting ceases, as they are very poisonous.

Paris Green. This, mixed and used as for Cherry Fly (*see* **Black Fly**), will generally get rid of the Beetle, if applied about thrice each season for two years. It should, however, only be used in severe cases.

Soot, applied in the same manner as White Hellebore, and in liberal quantities, will, in a season or two, clear the beds. If a bushel of salt be mixed with each twenty bushels of soot, it will enhance the effect.

ASPARAGUS KNIFE. The Asparagus Knife consists of a strong blade fixed in a handle. There are, or were, three kinds employed: In one form, the blade was blunt on

FIG. 162. ASPARAGUS KNIFE.

both sides, straight, with a sharp tip, and not unlike a small chisel. Another had its blade slightly hooked, and serrated at one end. But the best is that now almost universally employed, and which is illustrated by Fig. 162.

ASPASIA (from *aspazomai*, I embrace; the column embraced by the labellum). SYN. *Trophianthus.* ORD. *Orchideæ.* A genus of elegant, stove, Epidendrum-like, epiphytal Orchids, with the lip united to the column, and broad, thin pseudo-bulbs. The name *Aspasia* is now and then met with attached to another genus. Salisbury gave it to a liliaceous plant which is now referred to *Ornithogalum.* For culture and propagation, *see* **Stanhopea.**

A. epidendroides (Epidendrum-like).* *fl.* whitish yellow; sepals linear oblong, acute; petals obtuse, concave, lateral lobes of lip roundish, entire, middle lobe crenated emarginate. February. Pseudo-bulbs oblong, two-edged. *h.* 1ft. Panama, 1833.

A. lunata (crescent-marked).* *fl.* green, white, and brown, solitary; sepals and petals linear obtuse, spreading; lip three-lobed, lateral lobes short, middle one flat, nearly square, wavy. February. Pseudo-bulbs oblong, two-edged. *h.* 1ft. Rio Janeiro, 1843.

A. papilionacea (butterfly-like).* *fl.*, sepals and petals yellowish, mottled with brown lines on their internal inferior halves; lip fiddle-shape, its back very great, elliptic, apiculate; an orange-coloured area stands at its base, a wide violet disc before and around it. *h.* 9in. Costa Rica, 1876. Distinguished from *A. lunata* in having thirteen keels at the base of the lip, which is higher inserted, and in the echinulate anther. It is a beautiful but rare novelty.

A. psittacina (parrot-like). *fl.*, sepals and petals light green, with brown transverse bars, which sometimes consist of separate stripes, at other times of confluent ones; the fiddle-shaped lip shows two keels and a few purplish dots over its top; the column is brown at its top, then violet, and white at the base. Ecuador, 1878. It has a raceme of several flowers, usually one-sided, bent over.

A. variegata (variegated).* *fl.* green, spotted with yellowish red; sepals linear oblong; petals somewhat rhomboid, acute; lateral lobes of lip recurved, middle one fleshy, serrated. February. *h.* 9in. Panama, 1835. Deliciously sweet-scented in the morning.

ASPEN. *See* **Populus tremula.**

ASPERA. Rough, with hairs or points.

ASPERULA (from *asper*, rough; in allusion to the leaves). Woodruff. ORD. *Rubiaceæ.* Hardy herbs, rarely small shrubs. Flowers terminal and axillary, in fascicles. Leaves opposite, with one, two, or three stipulas on each side; they are therefore called four to eight in a whorl, but between the uppermost leaves there are no stipulas. Stems and branches usually tetragonal. Most of the species are very pretty when in flower, and are, therefore, well adapted for borders, rockwork, and shady places, in almost any garden soil. Propagated by divisions of the roots during spring and early summer. Herbaceous perennials, except where otherwise stated.

A. azurea-setosa (blue-bristly). A synonym of *A. orientalis.*

A. calabrica (Calabrian). A synonym of *Putoria calabrica.*

A. cynanchica (Cynanche-like). *fl.* on erect branches, forming a fastigiate corymb, white or bluish-coloured, elegantly marked with red lines, or sometimes pure white. Summer. *l.* four in a whorl; floral ones lanceolate-linear, acuminately awned; lower ones small, oblong, upper ones opposite. Plant glabrous, erectish. *h.* 9in. to 12in. England.

A. hirta (hairy). *fl.* white at first, changing to pink, with oblong divisions. July and August. *l.* usually six in a whorl, four towards the upper part, linear, hairy, deep green. *h.* 3in. Pyrenees, 1817. A charming but rare little alpine, thriving best in a rather damp position on the rockery.

A. longiflora (long-flowered).* *fl.* whitish, yellowish inside, and reddish outside; tube of corolla elongated; fascicles terminal, pedunculate; bracteas small, subulate. Summer. *l.* four in a whorl, linear; lower ones small, obovate; upper ones opposite. Stems weak, numerous, from the same neck, erectish, glabrous. *h.* 6in. Hungary, 1821.

A. montana (mountain).* *fl.*, corollas pink, four-cleft, scabrous externally; in fascicles. June, July. *l.* linear; lower ones six in a whorl; middle ones four; upper ones opposite; floral leaves linear. Stem weak, glabrous. *h.* 6in. to 8in. Hungary, 1801.

A. odorata (sweet-scented).* Sweet Woodruff. *fl.* snowy white; corymbs terminal, pedunculate, usually trifid, each division bearing about four flowers. May, June. *l.* eight in a whorl, lanceolate, smooth, with serrulately scabrous edges. Stems tetragonal, simple, erect, or ascending. *h.* 6in. to 12in. Britain. This very pretty little plant is scentless when fresh, but, when dried, it diffuses an odour like that of spring grass; and when kept among clothes, it not only imparts an agreeable perfume to them, but preserves them from insects.

A. orientalis (Oriental).* *fl.* sky-blue, in terminal heads; bracts of involucre shorter than the flowers. Summer. *l.* lanceolate, bristly, about eight in a whorl. *h.* 1ft. Caucasus, 1867. A charming little, profuse-blossoming, hardy annual, bearing clusters of fragrant flowers, admirably adapted for bouquet-making. SYN. *A. azurea-setosa.* See Fig. 165.

Asperula—*continued.*

FIG. 163. ASPERULA ORIENTALIS, showing Habit and Portion of Inflorescence.

A. taurina (bull). *fl.*, corollas white, elongated; corymbs pedunculate, axillary, fasciculately umbellate, involucrated; bracteas ciliated. April to June. *l.* four in a whorl, ovate-lanceolate, three-nerved, with finely ciliated margins. Plant smoothish, erect. *h.* 1ft. South Europe, 1739.

A. tinctoria (Dyers'). *fl.* white, reddish on the outside; usually trifid. June. *l.* linear; lower ones six in a whorl; middle ones four; and the uppermost ones opposite; floral leaves ovate. Plant procumbent, unless supported. Stem 1ft. to 2ft. long, purplish. Europe, 1764.

ASPHALT. Artificial Asphalt is now generally used in England for footpaths, &c. The recipes are various, one of the best being the following: Lime rubbish two parts, coal ashes one part (both must be very dry), sifted very fine; mix them, and leave a hole in the middle of the heap, wherein pour boiling hot coal tar; mix well together. When as stiff as mortar, lay it down, 3in. thick, on a dry and previously well-levelled surface. A boy should follow with dry, finely-sifted sand, distributing just enough to prevent his boots sticking to the tar. Two men should be employed for the tarring, whilst another should attend to the boiling operation. Only just enough tar to last ten minutes must be taken from the furnace at one time, as, if it be not boiling, the walks will become soft under the action of very hot sun. This may be repeated every three years. It is imperative that the surface, lime, coal ashes and sand be perfectly dry, and that the days selected for the operation be very fine, the hotter the better. Another excellent plan is that of using gas lime and coal ashes. There must be a firm foundation and smooth surface. Spread the gas lime to about 1½in. deep, and level with the back of a spade. Over this place a thin layer of coal dust, and well roll. The work is then complete.

ASPHODEL. *See* **Asphodelus.**

ASPHODELINE. ORD. *Liliaceæ.* A genus of plants allied to *Asphodelus*, but distinguished from it by having erect leafy stems. They thrive in any ordinary garden soil. Propagated by division.

A. brevicaulis (short-stemmed). *fl.* in lax, often panicled racemes, yellow, veined with green. *l.* subulate, ascending, lower ones 4in. to 6in. long. Stem slender, often flexuose. Orient.

A. damascena (Damascene). *fl.* white, in dense generally simple racemes, 6in. to 12in. long. *l.* in dense rosette, 6in. to 9in. long, subulate. Stem simple, erect. *h.* 1½ft. to 2ft. Asia Minor.

A. liburnica (Liburnian). *fl.* yellow, striped with green, in generally simple lax racemes, 6in. to 9in. long. Stem simple, erect, strict, 1ft. to 2ft. high, upper half naked. South Europe.

A. lutea (yellow). *fl.* yellow, fragrant, in a dense, very long, straight, simple raceme, in the axils of buff-coloured bracts, which are nearly as long as the flowers. Summer. *l.* numerous, awl-shaped, triangular, furrowed, smooth, dark green, marked with lines of a paler tint; root leaves tufted. Stem 3ft. or 4ft. high. Sicily, 1596. The best known and handsomest species. SYN. *Asphodelus luteus.*

A. l. fl.-pl. This resembles the species, but the flowers are double, and last much longer than those of the typical form; it is a very pretty plant.

Asphodeline—*continued.*

A. taurica (Taurian). *fl.* white, striped with green, in generally simple dense racemes, 6in. to 12in. long, 1in. to 2in. wide. Stem simple, erect, 1ft. to 2ft. high, densely leafy at base of raceme. Asia Minor, &c. SYN. *Asphodelus tauricus.*

A. tenuior (slenderer). *fl.* yellow, in simple lax-flowered racemes, 3in. to 4in. long, 2in. wide. Stem simple lower half leaf, upper naked, 1ft. Orient. SYN. *Asphodelus tenuior.*

ASPHODELUS (from *a*, not, and *sphallo*, to supplant; in allusion to the beauty of the flowers). Asphodel. ORD. *Liliaceæ*. Very pretty hardy herbaceous perennials, with fleshy fasciculated roots. Perianth white or yellow, of six equal spreading segments; stamens six, hypogynous, alternately long and short. Leaves usually radical, tufted, narrow, or triquetrous. All the species enumerated thrive in good deep sandy loam, and are very suitable for borders and shrubberies. Propagated by division of the root, which is best done in early spring.

A. æstivus (summer). *fl.* white. Summer. *h.* 2ft. Spain, 1820.

A. albus (white).* *fl.* white; peduncles clustered the length of the bracts. May. *l.* linear, keeled, smooth. Stem naked, simple. *h.* 2ft. South Europe, 1596.

A. creticus (Cretan).* *fl.* yellow. July. *l.* filiform, striated, toothed, ciliated. Stem leafy, naked above, branched *h.* 2ft. Crete, 1821.

A. fistulosus (pipe-stalked). *fl.* white. July, August. *l.* upright, striated, subulate, fistular. Stem naked. *h.* 18in. South Europe, 1596.

A. luteus (yellow). A synonym of *Asphodeline lutea.*

A. ramosus (branchy). *fl.* large, white, with a reddish-brown line in the middle of each segment, springing from the axils of ovate-lanceolate bracts, and in very long dense racemes. Summer. *l.* sword-shaped, stiff, sharply keeled below, channelled above. Stem much branched. *h.* 4ft. to 5ft. South Europe, 1829.

FIG. 164. ASPHODELUS VILLARSII, showing Habit and Flower.

A. Villarsii (Villars') *fl.* white; raceme dense, elongated; bracts dark brown. Stem simple or rarely branched. *h.* 1ft. to 2ft. Eastern France. See Fig. 164.

ASPIDISTRA (from *aspidiseon*, a little round shield; in reference to the form of the flower). SYN. *Porpax* (of Salisbury). Including *Plectogyne*. ORD. *Liliaceæ*. Hardy, or nearly hardy, evergreen, foliage plants. Flowers insignificant, produced close to the ground, remarkable for the curious mushroom-like stigma by which this genus is characterised. They thrive in almost any ordinary garden soil, but are best grown in rich loam, leaf soil, and sand; plenty of moisture being allowed. Propagated by suckers.

A. elatior (taller).* *l.* oblong, large, on long petioles, leathery; plant stemless. *h.* 1½ft. to 2ft. Japan, 1835. This very easily cultivated and quite hardy foliage plant is much grown for window gardening and other decorative purposes, for which it is well suited.

A. e. variegata (variegated).* A fine variety with alternately-striped green and white leaves.

Aspidistra—*continued.*

FIG. 165. ASPIDISTRA LURIDA.

A. lurida (lurid). *fl.* purple. July. *l.* oblong-lanceolate, on long petioles. *h.* 1ft. to 1½ft. China, 1822. A very graceful species, with long evergreen leaves. It is an effective plant for the outdoor garden during summer, and is nearly, if not quite, hardy. See Fig. 165.

A. punctata (dotted). *l.* lanceolate, on long stalks. *h.* 1ft. China. This is very closely allied to *A. elatior*, but of inferior value.

ASPIDIUM (from *aspidion*, a little buckler; in allusion to the form of the involucre). Shield Fern. ORD. *Filices*. Including *Cyclodium*, *Cyclopeltis*, *Cyrtomium*, *Phanerophlebia*, and *Polystichum*. Stove, greenhouse, or hardy ferns. Sori sub-globose, dorsal or terminal on the veinlets; involucre orbicular, fixed by the centre. They thrive in a compost of sandy peat with a little loam. Several species are admirably adapted for the indoor fernery. The hardy species are best grown in the shade; a little sandstone should be incorporated with the soil. For general culture, *see* **Ferns.**

FIG. 166. ASPIDIUM ACULEATUM.

A. acrostichoides (Acrostichum-like).* *sti.* 6in. to 8in. long, densely scaly below. *fronds* 1ft. to 2ft. long, 2in. to 6in. broad; pinnæ of the lower half barren, 2in. to 3in. long, ¼in. broad,

Aspidium—*continued.*

spinoso-serrated throughout, auricled at the base above; the pinnæ of the upper half fertile, much smaller. *sori* occupying the whole under side. North America. SYN. *Polystichum acrostichoides.* Hardy.

A. a. grandiceps (large-crested).* A very handsome fern, having the apices of the fronds and pinnæ heavily crested; equally desirable for the hardy or temperate fernery. Of garden origin.

A. a. incisum (incised).* A variety with the pinnules deeply cut and acutely pointed.

A. aculeatum (sharp-pointed).* The Hard Shield Fern. *sti.* tufted, 6in. to 12in. long, more or less scaly. *fronds* 1ft. to 3ft. long, 6in. to 12in. broad, ovate-lanceolate; lower pinnæ close, lanceolate, 4in. to 6in. long, ¼in. to ⅓in. broad; pinnules ovate-rhomboidal, unequal sided, auricled on the upper base; teeth aristate. *sori* nearer the midrib than the edge. A variable and hardy species, common throughout the world. SYN. *Polystichum aculeatum. A. a. proliferum* is a proliferous Australian form. *A. a. vestitum* has the rachis densely clothed to the point, both with reddish-brown fibrillose and large lanceolate dark brown scales. See Fig. 166.

A. amabile (lovely). *sti.* scattered, 6in. to 12in. long, slightly scaly below. *fronds* 1ft. or more long, 6in. to 12in. broad, with a lanceolate terminal pinna, and three to six lateral ones on each side, which are 3in. to 6in. long, 1in. to 1½in. broad, the lowest sometimes divided at the base; segments sub-rhomboidal, with at least half the lower side cut away, the upper side and part of the lower lobed and sharply spinuloso-serrated. *sori* sub-marginal. Ceylon. Stove species. SYN. *Polystichum amabile.*

A. angulare (angular). The Soft Shield Fern. Botanically this is only a variety of *A. aculeatum*; but, to the cultivator, it is abundantly distinct. The fronds are not so tapered at the base, the pinnules are more equal in size, and the lower ones distinctly stalked, while the texture is much less rigid than in *A. aculeatum*, the caudex has a tendency to elongate. Almost cosmopolitan in its distribution. SYN. *Polystichum angulare.* There are an enormous number of varieties, many of which are not under cultivation. Amongst the best found in gardens are *alatum, Bayliæ, concinnum, corymbiferum, cristatum, curtum, dissimile, grandiceps, imbricatum, Kitsoniæ, lineare, parvissimum, plumosum, polydactylon, proliferum, rotundatum, Wakeleyanum, Woollastoni.*

FIG. 167. ASPIDIUM ANGULARE GRANDICEPS.

A. a. grandiceps (large-crested). This is a narrow fronded variety, having the apices of the fronds branched and crested, ultimately producing a broad tasselled head. A very handsome fern. See Fig. 167.

A. anomalum (anomalous). *sti.* tufted, 1ft. to 2ft. long, densely scaly below. *fronds* 2ft. to 3ft. long, 1ft. or more broad; lower pinnæ 6in. to 9in. long, 2in. to 3in. broad; pinnules lanceolate, cut down in the lower part into oblong segments; teeth blunt or slightly mucronate. *sori* placed near the sinuses of the pinnules. Ceylon. Stove species. SYN. *Polystichum anomalum.*

A. aristatum (awned).* *rhiz.* creeping. *sti.* scattered, 9in. to 18in. long, very scaly below. *fronds* 1ft. to 2ft. long, 9in. to 12in. broad, ovate-deltoid, tri- or quadripinnatifid; lower pinnæ largest, 4in. to 6in. long, 2in. to 3in. broad; lowest pinnules much the largest, lanceolate-deltoid; teeth copious aristate. *sori* small, principally in two rows near the midrib. Japan, Himalayas, New South Wales, &c. Greenhouse species. SYN. *Polystichum aristatum.*

Aspidium—*continued.*

A. a. coniifolium (Conium-leaved).* *fronds* more finely divided; segments copiously toothed, with lower lobes distinct.

A. a. variegatum (variegated).* A handsome variety, with a broad band of green running through the bases of the pinnules along the course of the rachis.

A. auriculatum (eared).* *sti.* tufted, 4in. to 6in. long, scaly below or throughout. *fronds* 12in. to 18in. long, 2in. to 4in. broad; pinnæ numerous, sub-sessile, usually close, 1in. to 2in. long, about ¼in. broad, ovate-rhomboidal, falcate, acute, spinoso-serrated, the upper base auricled, the lower one truncate. *sori* in two rows. India, widely distributed. Stove species. SYNS. *A. ocellatum, Polystichum auriculatum.*

A. a. lentum (pliant). Pinnæ cut into oblong mucronate lobes about half-way down to the rachis, the auricle sometimes quite free.

A. a. marginatum (margined).* A variety with more coriaceous texture; upper edge of the pinnæ slightly lobed.

A. capense (Cape).* *sti.* scattered, 1ft. to 2ft. long, densely scaly below. *fronds* 1ft. to 3ft. long, 12in. to 18in. broad, sub-deltoid; lowest pinnæ the largest, 6in. to 9in. long, 3in. to 4in. broad; pinnules and segments lanceolate, the latter bluntly lobed. *sori* very large and copious. South America, New Zealand, Cape Colony, Natal, &c. Greenhouse species. SYNS. *A. coriaceum, Polystichum capense.*

A. confertum (compressed). Synonymous with *A. meniscioides.*

A. coriaceum (leathery). Synonymous with *A. capense.*

A. falcatum (hooked).* *sti.* tufted, 6in. to 12in. long, densely scaly below. *fronds* 1ft. to 2ft. long, 6in. to 9in. broad, simply pinnate; pinnæ numerous, the lower stalked, ovate-acuminate, falcate, 3in. to 5in. long, 1in. to 2in. broad; edge entire or slightly undulated, the upper side narrowed suddenly, sometimes auricled, the lower rounded or obliquely truncate at the base. *sori* small, copious, scattered. Japan, China, Himalayas, &c. SYN. *Cyrtomium falcatum.*

A. f. caryotideum (Caryota-like) has pinnæ sometimes larger, sharply toothed, slightly lobed, sometimes auricled on both sides. SYN. *Cyrtomium caryotideum.*

A. f. Fortunei (Fortune's).* This differs from the type in having pinnæ narrower and more opaque. All are most useful house ferns, and quite hardy in many parts of the country. SYN. *Cyrtomium Fortunei.*

A. falcinellum (finely-hooked).* *sti.* tufted, 4in. to 8in. long, densely scaly. *fronds* 9in. to 18in. long, 3in. to 6in. broad; central pinnæ 2in. to 3in. long, ¼in. broad; point acute; edge finely serrated; the upper side bluntly auricled, the lower obliquely truncate at the base. *sori* in two long rows. Madeira. Greenhouse species. SYN. *Polystichum falcinellum.*

A. flexum (bending). *rhiz.* stout, wide-creeping. *sti.* scattered, 1ft. long, scaly. *fronds* 2ft. to 3ft. long, 9in. to 12in. broad; lower pinnæ lanceolate-deltoid, 4in. to 6in. long, 2in. to 4in. broad; pinnules lanceolate-deltoid, cut down to the rachis below into oblong bluntly-lobed segments. *sori* large, in two rows, copious. Juan Fernandez. Stove species. SYN. *Polystichum flexum.*

A. fœniculaceum (Fennel-leaved).* *rhiz.* creeping. *sti.* scattered, 6in. to 12in. long, densely scaly below. *fronds* 1ft. to 2ft. long, and 9in. to 12in. broad, lanceolate-deltoid, four to five pinnatifid; lower pinnæ 6in. to 8in. long, 3in. to 4in. broad; ultimate divisions linear, awned, with a firm texture. *sori* solitary. Greenhouse species. Sikkim, 7,000ft. to 10,000ft. SYN. *Polystichum fœniculaceum.*

A. frondosum (leafy). *sti.* scattered, 1ft. to 2ft. long, densely scaly below. *fronds* 18in. to 24in. long, 1ft. or more broad, sub-deltoid; lower pinnæ much the largest, long stalked; pinnules lanceolate; segments very unequal sided, pinnatifid, with rounded mucronate lobes, obliquely truncate at the base below. *sori* large, copious. Madeira. Greenhouse species. SYN. *Polystichum frondosum.*

A. Hookeri (Hooker's). *sti.* 1ft. or more long, naked. *fronds* 2ft. to 3ft. long; pinnæ 6in. to 8in. long, 1in. broad, cut down to a broadly-winged rachis into nearly close, spreading, entire, linear-oblong lobes ¼in. broad. *sori* nearer the edge than the midrib. Malay Archipelago. Stove species. SYNS. *A. nephrodioides* and *Cyclodium Hookeri.*

A. laserpitiifolium (Laserpitium-leaved).* *sti.* 4in. to 6in. long, stramineous, scaly at base. *fronds* 12in. to 18in. long, 6in. to 9in. broad, ovate-deltoid, tripinnate; lower pinnæ the largest, with pinnules on the lower side prolonged, lanceolate, imbricated with small, distinct, bluntly-lobed segments. *sori* in two rows, very copious. Japan. A very desirable greenhouse species. SYNS. *Lastrea Standishii* (of gardens) and *Polystichum laserpitiifolium.*

A. lepidocaulon (scaly-stemmed). *sti.* tufted, 6in. to 9in. long, densely clothed with large cordate scales. *fronds* 1ft. or more long, 4in. to 6in. broad, sometimes elongated and rooting at the point; pinnæ 2in. to 3in. long, ⅛in. to ¼in. broad, lanceolate-falcate, the two sides unequal, the upper one auricled at the base. *sori* principally in two rows, near the midrib. Japan. Greenhouse species. SYN. *Polystichum lepidocaulon.*

A. Lonchitis (spar-like).* The Holly Fern. *sti.* densely tufted, 1in. to 4in. long, scaly at base. *fronds* 1ft. to 2ft. long, 1in. to 3in. broad, pinnate throughout; pinnæ ¼in. to 1½in. long, ⅛in. to ¼in. broad, ovate-rhomboidal, sub-falcate, the two sides unequal,

Aspidium—*continued.*

point mucronate, edge spinuloso-serrated, the upper side sharply auricled at the base, the lower obliquely truncate. Britain, &c. A very widely-spread hardy species. SYN. *Polystichum Lonchitis.*

A. meniscioides (Meniscium-like). *sti.* 1ft. to 2ft. long, scaly below. *fronds* 2ft. to 3ft. long, 1ft. or more broad, pinnate; barren pinnæ sessile, 6in. to 9in. long, 1½in. to 2in. broad, oblong-acuminate, nearly entire; fertile pinnæ much smaller. *sori* in two close rows between the primary veins. West Indies, &c. Stove species. SYNS. *A. confertum* and *Cyclodium meniscioides.*

A. mohrioides (Mohria-like). *sti.* tufted, 2in. to 6in. long, more or less densely scaly. *fronds* 6in. to 12in. long, 2in. to 3in. broad, bipinnate; pinnæ numerous, frequently imbricated, lanceolate, cut down below into slightly toothed, oblong-rhomboidal pinnules. *sori* copious. Patagonia and the Cordilleras of Chili. Greenhouse species. SYN. *Polystichum mohrioides.*

A. mucronatum (mucronated).* *sti.* tufted, 2in. to 4in. long, densely scaly. *fronds* 12in. to 18in. long, 1½in. to 2in. broad, pinnate throughout; pinnæ very numerous, often imbricated, ¾in. to 1in. long, ¼in. to ⅜in. broad, sub-rhomboidal, unequal-sided, mucronate, sub-entire, distinctly auricled at the upper base. *sori* in a long row on each side the midrib. West Indies. Stove or greenhouse species. SYN. *Polystichum mucronatum.*

A. munitum (armed).* *sti.* tufted, 4in. to 9in. long, densely scaly. *fronds* 1ft. to 2ft. long, 4in. to 8in. broad; pinnæ close, 2in. to 4in. long, about ½in. broad, acuminate, finely spinulose and serrated throughout, the upper side auricled, and the lower obliquely truncate at the base. *sori* in two rows near the edge. California, &c. Hardy; very fine. SYN. *Polystichum munitum.*

A. nephrodioides (Nephrodium-like). Synonymous with *A. Hookeri.*

A. ocellatum (spotted). Synonymous with *A. auriculatum.*

A. pungens (stinging). *rhiz.* stout. *sti.* scattered, 1ft. long, scaly below only. *fronds* 2ft. to 3ft. long, 9in. to 12in. broad; lower pinnæ 4in. to 6in. long, 2in. to 3in. broad; pinnules ovate-rhomboidal, unequal-sided, often deeply pinnatifid. *sori* principally in two rows near the midrib. Cape Colony. Greenhouse species. SYN. *Polystichum pungens.*

A. repandum (wavy-leaved). *sti.* 1ft. to 2ft. long, naked. *fronds* 2ft. or more long, 12in. to 18in. broad, apex deeply pinnatifid, with linear-oblong, slightly sinuated lobes; lower pinnæ four to eight on each side, 6in. to 8in. long, 1½in. to 1½in. broad, acuminate; edge bluntly sinuated, the lowest stalked and forked. *sori* in two distinct rows near the main vein. Philippines. Stove species.

A. rhizophyllum (frond-rooting). *sti.* tufted, 1in. to 2in. long, slender. *fronds* 2in. to 6in. long, ⅜in. broad, with the long, narrow upper half of the frond lengthened out and rooting, the lower half cut down to a flattened fibrillose rachis into oblong-rhomboidal sub-entire lobes about ½in. broad, ¼in. deep. *sori* scattered. Jamaica, 1820. Stove or cool house species. SYN. *Polystichum rhizophyllum.*

A. semicordatum (half-cordate). *sti.* scattered, 6in. to 12in. long. *fronds* 2ft. to 3ft. long, 8in. to 12in. broad, simply pinnate; pinnæ spreading, 4in. to 6in. long, ½in. to ¾in. broad, nearly entire, acuminate, cordate or truncate at the base. *sori* in one to three rows on each side, the inner one close to the midrib. Tropical America, &c. SYN. *Polystichum semicordatum.*

A. trapezioides (Trapezium-like). Synonymous with *A. viviparum.*

A. triangulum (triangular).* *sti.* tufted, 2in. to 6in. long, base scaly. *fronds* 1ft. or more long, 1½in. to 2in. broad; pinnæ numerous, sessile, lower ones distant, central ones ¾in. to 1in. long, about ⅝in. broad, sub-deltoid, lower side obliquely truncate; apex mucronate, edge sub-entire or slightly lobed, with blunt or spinose teeth, one or both sides auricled at the base. *sori* principally in two rows near the edge. West Indies. Stove or greenhouse species. SYN. *Polystichum triangulum.*

A. trifoliatum (three-leaved). *sti.* tufted, 1ft. or more long, base only scaly. *fronds* 12in. to 18in. long, 6in. to 12in. broad, with a large ovate-acuminate terminal pinna, narrowed or forked at the base, and one or two lateral ones on each side, the lowest mostly forked. *sori* in rows near the main veins. Tropical America. Stove species.

A. t. heracleifolium (Heracleum-leaved). A form with pinnæ pinnatifid on both sides at the base.

A. tripteron (three-winged). *sti.* 6in. to 9in. long, densely scaly at base. *fronds* 12in. to 18in. long, with a large terminal and two small spreading lateral pinnæ at the base of it, the former 2½in. to 3in. broad, with very numerous spreading pinnules on each side, 1½in. long, about ½in. broad, unequal sided, acute, deeply inciso-pinnatifid, the lower lobes again toothed; lateral pinnæ 3in. to 5in. long, 1½in. to 2in. broad. *sori* principally in two rows midway between midrib and edge. Japan. Greenhouse species. SYN. *Polystichum tripteron.*

A. varium (variable).* *rhiz.* sub-creeping. *sti.* 6in. to 12in. long, densely fibrillose below. *fronds* 12in. to 18in. long, 9in. to 12in. broad, lanceolate-deltoid; lower pinnæ much the largest, sub-deltoid, unequal sided, 4in. to 6in. long, 3in. to 4in. broad; pinnules lanceolate, imbricated, with oblong, blunt, slightly toothed segments. *sori* principally in two rows near the midrib. Japan. Greenhouse species. SYNS. *Lastrea varia* and *Polystichum varium.* It is frequently met with in gardens under the former name.

Aspidium—*continued.*

A. viviparum (bud-producing). *sti.* tufted, 4in. to 6in. long, scaly at the base. *fronds* 12in. to 18in. long, 4in. to 6in. broad; pinnæ numerous, nearly lanceolate, the central ones 2in. to 3in. long, about ½in. broad, mucronate, sometimes bud-bearing, the edge more or less deeply lobed, in the lower part sometimes quite down to the rachis, the upper side auricled. *sori* in two or four rows. West Indies. Stove or greenhouse species. SYNS. *A. trapezioides* and *Polystichum viviparum.*

ASPLENIUM (from *a*, not, and *splen*, spleen; referring to the medicinal properties formerly attributed to the genus). Spleenwort. ORD. *Filices.* Including *Anisogonium, Athyrium, Ceterach, Cœnopteris, Darea, Diplazium, Hemidictyum, Neottopteris.* A very large and widely-spread genus, including species suitable for the stove, temperate, and hardy ferneries. Sori dorsal or sub-marginal, linear or oblong. Involucre similar in shape, straight or occasionally curved, single or double, plane or tumid, bursting along the outer edge. The tropical species should be grown in a compost of peat, loam, and sand; the hardy sorts in a mixture of fibrous peat and sand. Good drainage is at all times required. For general culture, *see* **Ferns.**

FIG. 168. ASPLENIUM ADIANTUM-NIGRUM, showing Rootstock and back of Fertile Fronds.

A. abscissum (clipped). *sti.* tufted, 4in. to 8in. long. *fronds* 6in. to 12in. long, 3in. to 4in. broad, sometimes proliferous at the apex, with twelve to twenty horizontal pinnæ on each side, which are 1½in. to 2in. long, about ½in. broad, bluntish; edge inciso-crenate, the upper one narrowed suddenly at the base, the lower one obliquely truncate. *sori* short, in two regular rows, falling short of both midrib and edge. Tropical America. Stove species. SYN. *A. firmum.*

A. acuminatum (taper-pointed).* *sti.* 6in. to 9in. long. *fronds* 1ft. to 2ft. long, 9in. to 12in. broad, with very numerous close-

Asplenium—*continued.*

placed lanceolate-oblong pinnæ on both sides, which are 4in. to 6in. long, 1½in. to 2in. broad; pinnules numerous, unequal-sided, lanceolate, acuminate; edges sharply toothed, the lower base obliquely truncate. *sori* in two rows in the upper part of the pinnules, often diplazioid. Sandwich Islands. Greenhouse species. SYN. *A. polyphyllum.*

A. Adiantum-nigrum. Black Spleenwort. *sti.* tufted, 6in. to 9in. long. *fronds* 6in. to 12in. long, 4in. to 6in. broad, sub-deltoid; lower pinnæ deltoid, 2in. to 3in. long, 1½in. to 2in. broad; all the pinnæ pinnate. *sori* copious, at last often occupying the whole under surface of the segments. Great Britain. World-wide in its distribution. Hardy. *A. solidum*, from Cape Colony, is supposed to be a mere form of this species. There are several varieties the best of which are described below. See Fig. 168.

A. A.-n. acutum (acute). *fronds* 9in. to 15in. long, deltoid, tripinnate; ultimate segments linear, and very acute. Ireland. A copiously divided and very elegant variety. Habit more graceful than the type.

FIG. 169. ASPLENIUM ADIANTUM-NIGRUM GRANDICEPS.

A. A.-n. grandiceps (large-crested). *fronds* 6in. to 12in. long; pinnæ comparatively short, and slightly crested; apex freely divided, and expanded into a broad crest, which gives the frond a very graceful contour. Frame or greenhouse variety. See Fig. 169.

A. A.-n. oxyphyllum (sharp-leaved). *fronds* 4in. to 6in. long, ovate-lanceolate; ultimate segments narrow and very acute. A very pretty little variety.

A. affine (related). *sti.* 6in. to 12in. long. *fronds* 12in. to 18in. long, 6in. to 12in. broad, bipinnate, with numerous pinnæ on each side, the lower ones lanceolate-rhomboidal; pinnules rhomboidal, inciso-serrate. *sori* copious, linear. Mascaren Islands, &c. Stove or warm greenhouse species. SYN. *A. spathulinum.*

A. alatum (winged).* *sti.* 4in. to 6in. long, slender, the upper part and the rachis, winged. *fronds* 1ft. to 1½ft. long, 3in. to 4in. broad, with twelve to twenty horizontal sessile pinnæ on each side, which are 1in. to 1½in. long, and about ½in. broad, bluntish; edge uniformly inciso-crenate, the base nearly equal on both sides. *sori* distant, not reaching either the midrib or edge. West Indies, &c. A very elegant stove species.

A. alismæfolium (Alisma-leaved). *sti.* 2in. to 6in. long. *fronds* varying in shape, from simple oblong-lanceolate, 6in. to 9in. long, 2in. to 3in. broad; apex acuminate; edges entire, to ternate or pinnate, with a large terminal and three pairs of lateral pinnæ, each like the entire frond of the simple state; texture coriaceous. Isle of Luzon. Stove species. SYN. *Anisogonium alismæfolium.*

A. alternans (alternated). *sti.* tufted, 1in. to 2in. long. *fronds* 6in. to 8in. long, 1in. to 1½in. broad, lanceolate-oblong, cut down into numerous bluntly-rounded lobes on each side, which reach very nearly down to the rachis, the lower gradually reduced. *sori* copious. N. W. Himalayas. Greenhouse species. SYN. *A. Dalhousiæ.*

A. alternifolium (alternate-leaved). Synonymous with *A. germanicum.*

A. angustifolium (narrow-leaved).* *sti.* tufted, about 1ft. long. *fronds* 18in. to 24in. long, 4in. to 6in. broad, simply pinnate, lanceolate-oblong, flaccid, with twenty to thirty sub-sessile pinnæ on each side, sterile ones largest, 2in. to 3in. long, ½in. broad, acuminate; edge obscurely-crenate, base rounded and equal on both sides; fertile pinnæ narrower and more distant. *sori* very close and regular, extending from the midrib nearly to the edge. Canada, &c. Greenhouse species.

A. anisophyllum (unequal-leaved). *sti.* tufted, 6in. to 12in. long. *fronds* 1ft. to 2ft. long, 6in. to 9in. broad, oblong-lanceolate, simple pinnate, with ten to sixteen sub-sessile pinnæ on each side

Asplenium—*continued.*

which are 3in. to 5in. long, about 1in. broad, acuminated, crenate, the two sides unequal, the upper one narrowed suddenly, the lower one obliquely truncate at the base. *sori* distant, elliptical, reaching half-way from the edge to the margin. Cape Colony, &c. Greenhouse species.

A. apicidens (apex-toothed). A variety of *A. Vieillardii.*

A. arborescens (tree-like). *cau.* oblique. *sti.* 1ft. to 2ft. long. *fronds* 3ft. to 4ft. long, 2ft. to 3ft. broad, deltoid, tripinnatifid, with numerous pinnæ, the lower ones 12in. to 18in. long, 4in. to 6in. broad; pinnules 3in. long, about ½in. wide, acuminate, edge cut two-thirds of the way down to the rachis into nearly entire lobes, ½in. deep, ⅛in. broad. Lower *sori* ½in. long. Mauritius, &c., 1826. Stove species. SYN. *Diplazium arborescens.*

A. Arnottii (Arnott's). *sti.* smooth, angular. *fronds* ample, tripinnatifid: lower pinnæ 9in. to 12in. long, 4in. to 6in. broad; pinnules 3in. to 4in. long, 1in. or more broad, cut down below to a distinctly winged rachis into deeply crenate, blunt, oblong lobes, ½in. deep, ⅛in. broad. *sori* copious, nearly all diplazioid, and filling up when mature nearly the whole surface of the lobes. Sandwich Islands, 1877. Greenhouse species. SYNS. *A. diplazioides* and *Diplazium Arnottii.*

A. aspidioides (Aspidium-like). *sti.* tufted, 6in. to 12in. long. *fronds* 1ft. to 2ft. long, 8in. to 12in. broad, ovate-deltoid, tripinnatifid; lower pinnæ 6in. to 8in. long, lanceolate-deltoid; pinnules lanceolate, cut down below nearly to the rachis into inciso-pinnatifid ovate segments, two lines broad. *sori* copious, oblong, the lower ones curved. Tropical America, &c. Greenhouse species. SYN. *A. multisectum.*

A. attenuatum (attenuated). *sti.* tufted, 3in. to 4in. long. *fronds* simple, linear-lanceolate, about 1ft. long, about ½in. broad, narrowed upwards very gradually, sometimes proliferous at the point, the margin toothed; the lower third also lobed; the lowest roundish, lobes reaching down nearly or quite to the rachis. *sori* reaching nearly to the edge. Queensland, &c. Greenhouse species.

A. aureum (golden). A variety of *A. Ceterach.*

A. auriculatum (auriculated).* *sti.* tufted, 4in. to 8in. long. *fronds* 12in. to 18in. long, 4in. to 6in. broad, simply pinnate, lanceolate-oblong, with ten to twenty-stalked horizontal pinnæ on each side, which are 2in. to 4in. long, ⅔in. to 1in. broad, lanceolate, often sub-falcate; edge deeply crenate, the two sides unequal, the upper one with a cordate auricle, the lower one obliquely truncate. *sori* distant, not reaching either the midrib or edge. Tropical America, 1820. Stove species.

A. auritum (eared). *sti.* tufted, 4in. to 8in. long. *fronds* 6in. to 12in. long, 2in. to 4in. broad, simply pinnate, with ten to fifteen stalked horizontal pinnæ on each side, which are 2in. to 3in. long, and about ½in. broad, acute or bluntish; edge sharply toothed or often lobed, especially on the upper side towards the base. *sori* in two broad rather oblique rows. Tropical America. Stove species.

A. australasicum (Australian). A variety of *A. Nidus.*

A. Baptistii (Baptist's).* *sti.* 6in. to 8in. long. *fronds* 1ft. long, bipinnate, broadly ovate; pinnæ stipitate, the lower about 5in. long, with four narrow stipitate linear-toothed pinnules, 2in. long, and a terminal lobe, 3½in. long, ½in. broad, furnished with distinct linear marginal teeth, pointing forwards, and terminating in a long attenuated point, which is toothed nearly to the end. *sori* linear-oblong, straight, parallel with, and close to, the midrib. South Sea Islands, 1879. A very handsome stove species.

A. Belangeri (Belanger's).* *sti.* tufted, 4in. to 8in. long. *fronds* 12in. to 18in. long, 2in. to 3in. broad, bipinnate; pinnæ numerous, 1in. to 1½in. long, ½in. broad, rounded at the point, truncate at the base on the lower side; pinnules linear, erecto-patent, half line broad; one vein and sorus to each segment, the latter marginal. Malayan Peninsula. Stove species. SYNS. *A. Veitchianum, Darea, Belangeri*, &c.

A. bipartitum (twice-partite). *sti.* tufted, 3in. to 6in. long. *fronds* 6in. to 8in. long, 2in. to 3in. broad, bipinnate, with about ten to fifteen stalked pinnæ on each side, which are 1in. to 1½in. long, ½in. to ⅔in. broad, bluntish, cut down at the base on the upper side into one distinctly-stalked cuneate pinnule, sometimes into two or three, the outer edge inciso-crenate, the base on the lower side obliquely truncate. *sori* in two regular rows, reaching nearly to the edge. Mascaren Isles. Stove species.

A. bisectum (bisected).* *sti.* tufted, 4in. to 6in. long. *fronds* 12in. to 18in. long, 4in. to 6in. broad, bipinnatifid, with twenty to thirty horizontal pinnæ on each side, which are 2in. to 3in. long, ½in. broad, with a very long, narrow, deeply inciso-pinnatifid upper portion, the base on the upper side narrowed suddenly, on the lower obliquely truncate. *sori* almost all in two parallel rows close to the midrib. West Indies, &c. Stove species.

A. brachypteron (broadly-winged). *sti.* tufted, 2in. to 4in. long. *fronds* 4in. to 6in. long, 1in. to 1½in. broad, bipinnate, with twelve to twenty-four horizontal pinnæ on each side, of which from half to nearly the whole of the lower side is cut away, the largest ½in to ⅔in. long, cut down to the rachis into simple or forked linear pinnules, 1in. to 1½in. long. *sori* solitary, often quite marginal. Madagascar, &c. Stove species. SYN. *Darea brachypteron.*

A. brevisorum (shortly-soriate). *sti.* 12in. to 18in. long. *fronds* 2ft. to 3ft. long, 9in. to 18in. broad, tripinnate; lower pinnæ 1ft.

Asplenium—*continued.*

or more long; pinnules lanceolate, distant, 2in. to 3in. long, and 1½in. broad; segments lanceolate, ⅜in. long, two lines broad, deeply and sharply toothed. *sori* small, six to twelve to a segment, in two rows near the midrib, the lower ones curved, often double. Jamaica, &c. Stove species. SYN. *Athyrium brevisorum.*

A. bulbiferum (bulb-bearing). *sti.* tufted, 6in. to 12in. long. *fronds* 1ft. to 2ft. long, 8in. to 12in. broad, oblong-deltoid, with numerous horizontal pinnæ on each side, which are often proliferous from the upper surface, the largest 4in. to 8in. long, 1½in. to 2in. broad; pinnules lanceolate-deltoid, slightly toothed. *sori* oblong, when mature often filling the whole breadth of the segments. New Zealand, &c., very widely distributed. Greenhouse species.

A. b. Fabianum (Fabia's). Lower segments deeply pinnatifid, with narrow divisions and sub-marginal sori. SYN. *A. Fabianum.*

A. b. laxum (loose). Habit more slender; segments narrow, so that the sori are often as if marginal.

A. caudatum (tailed). Probably a form of *A. falcatum*, but having the sori more confined to the centre of the pinnæ, being often restricted to two parallel rows close to the rachis. Polynesia, &c. Greenhouse species.

FIG. 170. ASPLENIUM CETERACH.

A. Ceterach.* Scale or Scaly Fern. *sti.* densely tufted, 1in. to 3in. long, scaly. *fronds* 4in. to 6in. long, ½in. to 1in. broad, cut down nearly or quite to the rachis into alternate, blunt, sub-entire, broadly-oblong or roundish pinnæ, with a rounded sinus between them; upper surface naked, lower densely clothed with deep brown membranous scales. *sori* linear oblique. Britain, throughout Europe, Northern Asia, &c. This is a variable species, but the forms do not remain constant under cultivation. It should be firmly planted in a vertical chink of the rockery in loam, lime rubbish, rock chippings, and sand, and be watered freely during the summer. SYN. *Ceterach officinarum.* See Fig. 170.

A. C. aureum (golden).* A large variety, producing fronds from 9in. to 15in. long, 1½in. to 3in. broad, and pinnæ more oblong than the type; scales toothed. Canaries and Madeira. This is a charming fern, requiring greenhouse treatment. SYN. *Ceterach aureum.*

A. cicutarium (Cicuta-leaved).* *sti.* tufted, 4in. to 8in. long. *fronds* 6in. to 15in. long, 4in. to 6in. broad, tripinnate, with ten to fifteen horizontal pinnæ on each side, the lower ones 2in. to 3in. long, 1in. broad, cut down to the rachis into numerous ovate-rhomboidal pinnules, which are ⅛in. to ¼in. long, ⅛in. broad, obliquely-truncate on the lower side; segments once or twice cleft at the apex. *sori* principally in two rows along the pinnules. Tropical America, &c. Stove species.

A. Colensoi (Colenso's). *sti.* tufted, 3in. to 4in. long. *fronds* 6in. to 9in. long, 2in. to 4in. broad, tripinnatifid, with numerous rather rigid erecto-patent pinnæ, the lower on stalks ⅛in. to ¼in. long; lower pinnules spreading, deeply inciso-pinnatifid, with linear segments. *sori* oblong, solitary. New Zealand. A beautiful greenhouse species. SYN. *A. Hookerianum.*

A. compressum (compressed). *sti.* tufted, 6in. to 8in. long. *fronds* 2ft. to 3ft. long, 8in. to 12in. broad, simply pinnate, lanceolate-oblong, with ten to twenty sessile pinnæ on each side, which are 4in. to 6in. long, about 1in. broad, acute or bluntish at the point, edge slightly dentate, the upper ones decurrent at the base upon the stout fleshy compressed rachis, the upper side narrowed suddenly at about a right angle, the lower one obliquely truncate. *sori* broad, distant, not reaching either the midrib or edge. St. Helena. Stove or greenhouse species.

A. contiguum (contiguous). *sti.* tufted, 6in. to 9in. long. *fronds* 12in. to 18in. long, 4in. to 6in. broad, with twenty to thirty horizontal sub-falcate pinnæ on each side, which are acuminated at the apex; edge more or less serrated, the base narrowed suddenly, and sometimes auricled on the upper, obliquely truncate in a curve on the lower side. *sori* close, copious, falling considerably short of the margin Sandwich Isles. Greenhouse species.

Asplenium—*continued.*

A. crenatum (crenated).* *sti.* 6in. to 12in. long, scattered. *fronds* 9in. to 15in. each way, deltoid, tri- or quadripinnate, with nine to twelve pinnæ on each side, the lowest much the largest, 6in. to 9in. long, 1½in. to 2in. broad; pinnules lanceolate, cut down to the rachis except towards the point on each side into four to six blunt oblong segments, two lines long, one line broad, which are bluntly toothed. *sori* two to six to a segment, oblong, usually nearly straight, often double. Scandinavia, &c. Hardy species.

A. cultrifolium (hook-leaved).* *sti.* 4in. to 6in. long. *fronds* 6in. to 12in. long, 4in. to 6in. broad, bipinnate, deltoid-ovate, with a lobed terminal point and six to ten pinnæ on each side, which are 3in. to 4in. long, ½in. to ⅝in. broad, acute; edge broadly toothed, sometimes lobed below nearly or quite to the rachis, the base nearly at a right angle on the upper, but obliquely truncate on the lower side. *sori* falling short both of the edge and midrib. West Indies, 1820. Stove species. SYN. *Diplazium cultrifolium.*

A. cuneatum (wedge-shaped). *sti.* tufted, 6in. to 9in. long. *fronds* 6in. to 15in. long, 6in. to 9in. broad, tripinnatifid, narrow-deltoid, with numerous spreading pinnæ on each side, the lower 3in. to 4in. long, 1in. to 1½in. broad, lanceolate-deltoid, cut down to the rachis into several distinct ovate-cuneate pinnules, which are dentate and cut down in the lower part nearly or quite to the rachis. *sori* linear, sub-flabellate. West Indies, and widely distributed in both hemispheres, 1832. A very handsome stove species.

A. Dalhousiæ (Dalhousie's). Synonymous with *A. alternans.*

A. decussatum (decussate). *sti.* 1ft. to 2ft. long. *fronds* 2ft. to 4ft. long, simply pinnate, with numerous pinnæ on each side, which are 6in. to 12in. long, 1in. to 2in. broad, often proliferous in the axils; edge nearly entire. *sori* reaching nearly to the edge, and copiously double. Polynesian and Malayan Islands, &c. Stove species. SYN. *Anisogonium decussatum.*

A. dentatum (dentated).* *sti.* tufted, 2in. to 6in. long. *fertile fronds* 2in. to 3in. long, 1in. broad, with six to eight pairs of stalked, sub-opposite pinnæ, which are ½in. broad, ⅜in. deep, oblong-rhomboidal, the lower side at the base truncate in a curve, the outer edge irregularly crenate. *sterile fronds* smaller, on shorter stalks. *sori* copious, in two parallel rows. West Indies, &c., 1820. A pretty little greenhouse species.

A. dimidiatum (unequal-sided).* *sti.* tufted, 6in. to 12in. long. *fronds* 6in. to 15in. long, 4in. to 6in. broad, deltoid, simply pinnate, with six to nine opposite pairs of pinnæ, which are 2in. to 3in. long, ⅜in. to 1in. broad, acuminated, sharply serrated. *sori* radiant, narrow, long linear. Tropical America. Stove species.

A. dimorphum (two-formed).* *sti.* tufted, 6in. to 12in. long. *fronds* 2ft. to 3ft. long, 12in. to 15in. broad, ovate-deltoid, sterile and fertile ones different or combined; lower pinnæ ovate-deltoid, 6in. to 8in. long, 2in. broad, bluntly toothed, and the base on the lower side obliquely truncate; fertile pinnæ the same size, but with very narrow simple or forked pinnules. *sori* linear, solitary, marginal. Norfolk Island. One of the handsomest warm greenhouse species. SYNS. *A. diversifolium* (of gardens), and *Darea dimorpha.*

A. diplazioides (Diplazium-like). A synonym of *A. Arnottii.*

A. diversifolium (diverse-leaved). A garden synonym of *A. dimorphum.*

A. diversifolium (diverse-leaved). Synonymous with *A. maximum.*

A. ebeneum (ebony-stalked).* *sti.* tufted, 3in. to 6in. long. *fronds* 12in. to 18in. long, 2in. to 3in. broad, linear-lanceolate, with twenty to forty sessile pinnæ on each side, which are about 1in. long, ⅛in. broad; point acute or bluntish; edge faintly serrate; base hastately auricled, often cordate. *sori* ten to twelve on each side, oblong, short. Canada, &c., widely distributed, 1779. Greenhouse species. *A. ebenoides* is very like this, but the pinnæ are not cut down to the rachis, and the frond has an elongated point, which is only sinuated with a single row of sori on each side.

A. erectum (erect). Synonymous with *A. lunulatum.*

A. erosum (bitten). *sti.* tufted, 6in. to 9in. long. *fronds* 6in. to 12in. long, 4in. to 8in. broad, deltoid, with nine to fifteen pinnæ on each side, which are 3in. to 4in. long, ½in. to ⅝in. broad, the edge slightly lobed and crenato-dentate, the point acuminate, the two sides unequal. *sori* falling short of the edge. West Indies. Stove species.

A. esculentum (edible).* *cau.* sub-arborescent. *sti.* 1ft. to 2ft. long. *fronds* 4ft. to 6ft. long, pinnate or bipinnate; lower pinnæ 12in. to 18in. long, 6in. to 8in. broad; pinnules 3in. to 6in. long, about 1in. broad, acuminate; edge more or less deeply lobed; base narrowed suddenly, often auricled; lines of *sori* often on all the lateral veinlets. India, &c., 1822. Stove species. SYN. *Anisogonium esculentum.*

A. extensum (extended). *sti.* tufted, 4in. to 6in. long. *fronds* 12in. to 24in. long, about 1in. broad, with twenty to forty sessile pinnæ on each side, which are ⅛in. long, ⅛in. to ⅜in. deep, blunt and entire, the upper side rather the broadest and often cordate, the lower merely rounded at the base. *sori* linear-oblong, two or three on each side of the midrib. Andes of Columbia and Peru. A very rare greenhouse species, allied to our native *A. Trichomanes.*

Asplenium—*continued.*

A. Fabianum (Fabia's). Synonymous with *A. bulbiferum Fabianum.*

A. falcatum (hooked).* *sti.* tufted, 6in. to 9in. long. *fronds* 6in. to 18in. long, 4in. to 6in. broad, lanceolate, with six to twenty stalked, nearly horizontal pinnæ on each side, which are 2in. to 3in. long, ½in. to 1in. broad, acuminated, the edges lobed often one-third of the way down, and the lobes sharply toothed, the two sides unequal, and the lower one at the base obliquely truncate. *sori* in long irregular lines reaching nearly to the edge. Polynesian Islands, &c., widely distributed. A very elegant greenhouse species.

A. fejeense (Fijian).* *rhiz.* wide-climbing. *sti.* 6in. long, scaly below. *fronds* 18in. to 24in. long, 1in. to 1½in. broad, lanceolate, caudate, or acuminate at the apex, and often proliferous, narrowed below to a truncate base, the margin nearly entire. *sori* reaching from the midrib nearly to the edges. Fiji, Samoa, &c. Stove species.

A. Fernandesianum (Juan Fernandez). A variety of *A. lunulatum.*

A. Filix-fœmina (Lady Fern).* *sti.* tufted, 6in. to 12in. long. *fronds* 1ft. to 3ft. long, 6in. to 12in. broad, oblong-lanceolate, with numerous pinnate pinnæ, the lower ones spreading, lanceolate, 3in. to 6in. long, 1in. to 1½in. broad; pinnules deeply incisopinnatifid. *sori* linear-oblong, the lower ones often curved. Britain, and world-wide in its distribution. SYN. *Athyrium Filix-fœmina.* This handsome deciduous species has a great number of varieties, the most important of which are described below:

A. F.-f. acrocladon (summit-branched).* *fronds* 9in. to 15in. long, slender, bi- or tripinnate, the lower part very narrow, with the apices of the pinnæ sometimes crested; upper portion of the frond freely branched, divisions narrow and crested, the whole forming a broad head.

A. F.-f. acuminatum (taper-pointed).* *fronds* 9in. to 12in. long, lanceolate-acuminate in outline, with closely set pinnæ, which are similarly characterised, and particularly tapering at the apices.

A. F.-f. apiculatum (apiculate).* *fronds* 6in. to 15in. long, 2in. to 4in. broad, lanceolate-acuminate in outline, with variously furcate apices; pinnæ closely set with distinctly acuminated apices, and small roundish obtuse serrated pinnules.

A. F.-f. Applebyanum (Appleby's).* *fronds* narrow, 12in. to 24in. long, with short blunt pinnæ, while the extremities are dilated into a broad furcated crest, which is very striking upon such a narrow frond.

A. F.-f. Barnesii (Barnes's).* *fronds* 9in. to 15in. long, 3in. to 4in. wide, lanceolate in outline, abrupt at the top, bipinnate; pinnæ alternate, closely set, lanceolate, acutely pointed, with densely set, narrow, acutely serrate pinnules, with a very membranous texture.

A. F.-f. calothrix (beautiful-hair).* *fronds* 9in. to 15in. long, copiously divided into exquisitely fine segments, so that the fronds present a very light and delicate appearance.

A. F.-f. contortum (contorted).* *fronds* very diversified, the various pinnæ occasionally combining the characters of the varieties *Applebyanum* and *Victoriæ.*

A. F.-f. coronatum (coronate).* *fronds* 6in. to 12in. long, 2in. wide; pinnæ distinctly forked, sometimes slightly crested at the apices; the upper extremity of the frond copiously forked, and by the ramification of the divisions a broad crest is formed, about 3in. to 4in. across.

A. F.-f. corymbiferum (corymbose).* *fronds* 12in. to 18in. long, 4in. to 7in. broad, lanceolate-acuminate in general outline; pinnæ closely set, usually forked and crested at the apices, while the extremities of the fronds are dilated into broad crests, nearly or quite as wide at the broadest portion of the frond.

A. F.-f. crispum (crispy or curled).* *fronds* 6in. long, densely set with very finely divided pinnæ, which are thickly curled, presenting a crispy appearance.

A. F.-f. dissectum (dissected).* *fronds* 6in. to 12in. long, ovate or broadly lanceolate in form, with irregular and unequal pinnæ; the pinnules also differ very much, and are deeply cut, nearly down to the rachises.

A. F.-f. Elworthii (Elworth's).* *fronds* 12in. to 20in. long, lanceolate, tripinnate, terminated with a very dense crest, from 4in. to 6in. across; pinnæ and frequently the pinnules also more or less forked and crested.

A. F.-f. Fieldiæ (Field's).* *fronds* 12in. to 20in. long, narrow, with regular or variously-forked divided pinnæ, sometimes arranged crosswise, with a very graceful disposition.

A. F.-f. Friselliæ (Frisell's).* *fronds* pendent, sometimes 2ft. long, rarely exceeding 1in. wide, bi- or tripinnate; pinnæ alternate, imbricated, flabellate, with the margins of the pinnules or ultimate divisions dentate.

A. F.-f. grandiceps (large-crested).* *fronds* 9in. to 15in. long, lanceolate in outline, copiously forked both at the extremities of the pinnæ and frond. The latter is furnished with a very large globose crest, which causes the frond to present a beautifully arched appearance.

Asplenium—*continued.*

A. F.-f. Grantæ (Grant's).* *fronds* 9in. to 12in. long, lanceolate, or broadly so, very thickly set with pinnæ, copiously divided, with the apices of the latter turned up, so that the plant has a crisp or bristly appearance.

A. F.-f. Jonesii (Jones's).* *fronds* 12in. to 18in. long, oblong-lanceolate in outline, slightly acuminate, bipinnate, furnished at the extremities with a small crest; pinnæ alternate, copiously forked and crested at the apices, even having larger crests than the one at the upper extremity of the frond; pinnules narrow, dentate, slightly crested.

A. F.-f. minimum (smallest).* *fronds* 4in. to 6in. long, 1in. wide, lanceolate, bipinnate; pinnules densely set, imbricated, and crispy.

A. F.-f. Moorei (Moore's).* *fronds* 4in. to 8in. long, linear, terminated with a broad tasselled crest, 3in. or more in diameter; pinnæ small, scattered, variously forked, crested, and slender.

A. F.-f. multifidum (many-fid).* A very vigorous growing variety, producing fronds as large as those of the type, terminated with large tasselled crests; pinnæ and pinnules narrow, the former furnished with small crested apices. A variety known as *nanum* much resembles the foregoing, but the crests are more dense, and the fronds are usually not more than half the length.

A. F.-f. pannosum (pannose).* *fronds* 10in. to 20in. long, lanceolate in outline, from 4in. to 6in. in the broadest part, bi- or (rarely) tripinnate; pinnæ thickly set, closely alternated, lanceolate-acuminate in form, with deep cut pinnules, and distinctly but irregularly lobed; the whole frond is frequently tinged with reddish-purple.

A. F.-f. plumosum (feathery).* *fronds* 12in. to 30in. long, 4in. to 10in. broad, broadly lanceolate in outline, tripinnate, beautifully arched; pinnæ of the same form as the frond, copiously divided; pinnules again divided into very fine segments. There are several forms of this charming variety.

A. F.-f. Pritchardii (Pritchard's).* *fronds* 12in. to 30in. long, very narrow, tapering especially towards the apices; pinnæ decussate, imbricate, rather irregular, with the margins of the pinnules dentate. There is also a variety named *cristatum*, which is finely crested at the apices of the pinnæ, and is particularly striking.

A. F.-f. ramosa (branched).* *fronds* 9in. to 12in. long, the lower portion sparsely set with short irregular pinnæ, sharply cut into finely dentate pinnules; the upper part is divided into two main branches, which are again variously forked, and furnished with short pinnæ, the ultimate divisions furcate and slightly crested.

A. F.-f. scopæ (heavily-crested).* *fronds* 6in. to 16in. long, with a few scattered irregular pinnæ along the main rachis; some of the pinnæ are almost obsolete, while others are an inch long with oblong-dentate pinnules and a heavy terminal crest; the upper portion has several ramifications, each of which is copiously forked and heavily crested, the whole forming a corymbose head 3in. or 4in. in diameter, which gives the plant a pendent habit.

A. F.-f. sub-lunatum (half-crescent-shaped).* *fronds* 9in. to 20in. long, less than 1in. wide, with curious alternated, nearly crescent-shaped, much contracted pinnæ, sparingly divided, arching.

A. F.-f. Victoriæ (Victoria's).* *fronds* long, lanceolate in outline, with the apices crested, as well as those of the pinnæ; the latter are forked at the base, the divisions being divergent, and crossing those of the neighbouring pinnæ. A form named *gracilis* has narrower fronds, is more compact, and cresting rather thicker. There is also another form named *lineare*, having very small heavily crested fronds, and an extremely elegant appearance. The foregoing are the most important varieties, but a very comparative few of the total number. Although forms of an essentially hardy species, the greater number—and particularly the rarer sorts—should have a winter protection; or, what is far more preferable and satisfactory, they should be grown in the frame or temperate fernery.

A. firmum (firm-textured). Synonymous with *A. abscissum.*

A. fissum (cut).* *sti.* tufted, 2in. to 6in. long. *fronds* 2in. to 5in. long, 1in. to 2in. broad, oblong-deltoid, tripinnatifid, with a few distant pinnæ on each side; pinnules flabellato-cuneate, deeply pinnatifid; ultimate segments under half a line broad. *sori* linear-oblong, when mature occupying the whole breadth of the segments. South Europe. A pretty little frame or greenhouse species.

A. flabellifolium (fan-leaved).* *sti.* tufted, 3in. to 6in. long. *fronds* procumbent, wide straggling, elongated, and rooting at the apex, 6in. to 12in. long, ¾in. to 1in. broad, with ten to fifteen sessile flabellate pinnæ on each side, which are ¼in. to ½in. each way, broadly lobed; lobes sharply toothed, the base cut away in a curve on the lower side. *sori* oblique, irregular, copious. Temperate Australia, &c. Greenhouse species.

A. f. majus (greater). This is a larger form, with longer fronds and broader pinnæ.

A. flaccidum (relaxed). *sti.* tufted, 4in. to 8in. long. *fronds* 1ft. to 3ft. long, 4in. to 8in. broad, often pendent, with numerous lanceolate pinnæ, which are 4in. to 8in. long, and about ½in. broad, sometimes rather rigid and recurved, sometimes quite flaccid and drooping, like the main rachis, sometimes deeply pinnatifid, but more often cut down to the thick rachis in oblique or sub-falcate

Asplenium—*continued.*

linear lobes. *sori* in the divided form quite marginal. New Zealand, &c. SYNS. *A. odontites* and *Darea flaccida.*

A. fœniculaceum (Fennel-like). A variety of *A. fragrans.*

FIG. 171. ASPLENIUM FONTANUM.

A. fontanum (fountain).* *sti.* tufted, 2in. to 4in. long. *fronds* 3in. to 6in. long, 1in. to 1½in. broad, oblong-lanceolate; lower pinnæ short, reflexed; central ones horizontal, about ½in. long; pinnules stalked, lower ones oblong, deeply inciso-pinnatifid. *sori* copious, covering nearly the whole under surface of the pinnule. England, &c. Hardy. This requires to be planted in a well-drained chink of the rockery, in rich gritty soil. SYN. *A. Halleri. A. refractum* is a well-marked variety. See Fig. 171.

A. formosum (beautiful). *sti.* tufted, very short. *fronds* 12in. to 18in. long, 1in. broad, with twenty to thirty sessile horizontal pinnæ on each side, which are ½in. long, one and a-half to two lines deep; upper edge deeply cut, point rather obtuse, lower edge truncate in a straight line. *sori* linear-oblong, short, oblique, placed one to four on each side of the midrib. Tropical America, &c., 1822. A very elegant stove species.

A. fragrans (fragrant).* *sti.* tufted, 4in. to 8in. long. *fronds* 6in. to 9in. long, 3in. to 6in. broad, sub-deltoid, tripinnate, with numerous close placed deltoid pinnæ on each side, the lowest 3in. long, 1in. to 1½in. broad; pinnules lanceolate-deltoid; segments sub-spathulate, one line broad, dentate round the outer edge. *sori* copious. Tropical America, 1793. *A. fœniculaceum* is a variety with narrowly linear ultimate segments. Both are very handsome stove plants, the latter being especially beautiful.

A. Franconis (Franconis).* *sti.* tufted, 1ft. long. *fronds* 1ft. to 2ft. long, 9in. to 15in. broad, deltoid, with numerous pinnæ on each side, the lower ones 6in. to 8in. long, much acuminated, cut down in the lower half into distinct pinnules, 1½in. to 2in. long, ½in. broad, lanceolate, unequal sided, the edge cut half-way down below into oblong sharply-toothed lobes; the lower side obliquely truncate. *sori* in parallel rows, not reaching the edge. Mexico, &c. Stove species. SYN. *Diplazium Franconis.*

A. furcatum (forked).* *sti.* tufted, 4in. to 8in. long. *fronds* 6in. to 18in. long, 4in. to 6in. broad, with twelve to twenty pinnæ on each side, which are lanceolate-deltoid, 2in. to 3in. long, ⅔in. to 1in. broad, nearly or quite pinnate; pinnules linear-cuneate, sharply serrated on the outer edge. *sori* linear, distant. Very widely distributed in the tropical and sub-tropical regions of both hemispheres. A most elegant greenhouse species. SYN. *A. præmorsum.*

A. germanicum (German).* *sti.* densely tufted, 2in. to 4in. long. *fronds* 2in. to 3in. long, ½in. to 1in. broad, lanceolate, cut down to the rachis into a few narrow flabellato-cuneate pinnæ on each side, the lowest of which are again deeply cleft. *sori* linear, when mature covering the whole breadth, but falling short of the point of the pinnæ. Scotland and Norway to Hungary and Dalmatia. Hardy or frame species. SYN. *A. alternifolium.*

A. giganteum (gigantic). A synonym of *A. radicans.*

A. Goringianum pictum (painted).* A very pretty form of *A. macrocarpum*; the fronds are from 6in. to 18in. long, pendulous, somewhat lanceolate in form; rachis reddish, with the pinnæ next it on each side variegated, forming a central grey band throughout its entire length. Japan. Greenhouse species, or hardy in sheltered positions.

A. grandifolium (large-leaved). *sti.* 1ft. or more long. *fronds* 2ft. to 3ft. long, 9in. to 12in. broad, deltoid-lanceolate, the point pinnatifid, with twelve to twenty pinnæ on each side; the lower ones 2in. or more apart, distinctly stalked, 4in. to 6in. long, 1in. to 1½in. broad, acuminate; edge slightly toothed, and sometimes broadly lobed below, the base equally rounded on both sides. *sori* irregular, falling slightly short of both midrib and edge. Tropical America, 1793. Stove species. SYN. *Diplazium grandifolium.*

A. Grevillei (Greville's). *fronds* undivided, 12in. to 18in. long, 2in. to 3in. broad, lanceolate-spathulate, narrowed to an acute apex, and suddenly below to a broadly winged stipe, which grows

Asplenium—*continued.*

very gradually narrower downwards; the margin entire. *sori* usually extending within a short distance of the edge. India. Stove species.

A. Halleri (Haller's). Synonymous with *A. fontanum.*

A. Hemionitis (Hemionitis).* *sti.* tufted, 4in. to 8in. long. *fronds* 4in. to 6in. each way, hastate, with a triangular, acute terminal lobe, and two large, cordate, acute lateral ones, again bluntly or acutely lobed at the base; the basal sinus rounded, 1in. or more deep, and the lobes on each side imbricated over one another and the petiole. *sori* narrow upon the simple veins. South Europe, &c. A pretty greenhouse species. SYN. *A. palmatum.*

A. H. cristatum (crested).* Similar in frond form and size to the species, but the apices are crested and tasselled. Where variety is sought, this should certainly be grown.

A. H. multifidum (much-divided).* *fronds* quite as broad as long; the main divisions again freely divided or deeply cut, so as to give them a fringed outline. Azores.

A. heterocarpum (various-fruited).* *sti.* scattered, 4in. to 9in. long. *fronds* 6in. to 15in. long, 1½in. to 2in. broad, narrow-lanceolate, with very numerous close-placed dimidiate pinnæ on each side, which are ⅔in. to 1in. broad, ¼in. deep; the lower edge quite entire, the upper broadest towards the base, where it is narrowed suddenly, deeply incised throughout. *sori* one, or rarely two, together in the teeth. Himalayas, and widely distributed in south-eastern Asia. A very lovely stove or greenhouse species.

A. heterodon (variously-toothed). Synonymous with *A. vulcanicum.*

A. Hookerianum (Hooker's). Synonymous with *A. Colensoi.*

A. incisum (incised). *sti.* tufted, 1in. to 3in. long. *fronds* 6in. to 12in. long, 1½in. to 2in. broad, lanceolate, with numerous pinnæ on each side; lower distant and blunt, central ones 1in. long, ½in. broad, lanceolate-deltoid; pinnules ovate-rhomboidal, pinnate, much truncated at the base on the lower side and deeply inciso-pinnatifid. *sori* linear-oblong, one to each vein. Japan, &c. Greenhouse species.

A. javanicum (Javanese). *See* **Allantodia Brunoniana.**

A. lanceolatum (lanceolate).* *sti.* tufted, 3in. to 4in. long. *fronds* 6in. to 9in. long, 2in. to 4in. broad; lower pinnæ distant, 1in. to 1½in. long, ½in. to ⅔in. broad; pinnules oblong-rhomboidal, sharply toothed, and often broadly lobed below. *sori* copious, when mature covering nearly the whole under surface. South-west Europe, including southern England, &c. Hardy species.

A. l. crispatum (curled).* *fronds* 4in. to 8in. long, broadly-lanceolate, bipinnate, with the margins of the pinnules involute and sharply toothed, giving them a curled appearance.

A. l. microdon (small-toothed).* *fronds* 4in. to 6in. long, simply pinnate, with deeply lobed pinnæ, the margins of the lobes very finely dentated and toothed. A pretty little gem, well adapted for case culture.

A. lanceum (lance-shaped). *sti.* scattered, 4in. to 6in. long. *fronds* 6in. to 9in. long, ⅔in. to 1in. broad, attenuated gradually upwards and downwards, the edge entire or slightly undulated. *sori* linear, irregular, reaching nearly to the edge, but not to the midrib. Himalayas, &c. Greenhouse species. SYN. *A. subsinuatum* and *Diplazium lanceum*

A. laserpitiifolium (Laserpitium-leaved).* *sti.* tufted, 6in. to 12in. long, naked. *fronds* 1ft. to 4ft. long, 4in. to 18in. broad, deltoid-lanceolate, with numerous pinnæ on each side, 2in. to 9in. long, and from 2in. to 6in. broad, cut down to the rachis into numerous distinct pinnules, the lowest with rhomboidal-cuneate segments. *sori* short, irregular. Polynesian Islands, North Australia, &c. A very handsome greenhouse species.

A. laxum (loose). A variety of *A. bulbiferum.*

A. lineatum (streaked). *sti.* tufted, 6in. to 9in. long. *fronds* 1ft. to 2ft. long, 4in. to 8in. broad, oblong-lanceolate, with twenty to thirty pinnæ on each side, which are 3in. to 4in. long, about ½in. broad, acuminate, dentate, nearly or quite sessile, the base cuneate. *sori* very regular, reaching from the midrib nearly to the edge. Mauritius, &c. There are several forms of this species: those with small narrow cuneate pinnules, *inequale*; those with deeply bifid or pinnatifid pinnules, *bifida.* Stove species.

A. longissimum (longest).* *sti.* tufted, 3in. to 12in. long. *fronds* 2ft. to 8ft. long, 4in. to 8in. broad, lanceolate-elongate, pendulous, proliferous, and rooting at the apex, with very numerous pinnæ on each side, which are 2in. to 4in. long, ½in. broad, acuminated, the two sides nearly equal, with a distinct central midrib; edge slightly toothed, the base on both sides often auricled. *sori* numerous, in two regular rows on each side the midrib, and reaching nearly to the edge. Malacca, &c., 1840. A very distinct stove fern for baskets.

A. lucidum (clear). A synonym of *A. obtusatum lucidum.*

A. lunulatum (crescent-shaped).* *sti.* tufted, 2in. to 4in. long. *fronds* 6in. to 18in. long, 1½in. to 2in. broad, simply pinnate, narrowly lanceolate-oblong, with twelve to twenty pinnæ on each side, which are 1in. to 1½in. long, ½in. to ⅔in. broad, bluntish or acute, more or less deeply inciso-crenate throughout, the two sides unequal; the upper one on the base narrowed suddenly, the lower one obliquely truncate; lower pinnæ often deflexed. *sori* falling short of both edge and midrib. Tropics. SYN. *A. erectum.*

Asplenium—*continued.*

A. l. Fernandesianum (Fernandez).* A form with a more rigid rachis and sub-coriaceous, rather narrower pinnæ. Juan Fernandez.

A. macrocarpum (large-fruited). *sti.* 6in. to 9in. long. *fronds* 12in. to 24in. long, 6in. to 12in. broad, ovate-lanceolate, with numerous pinnæ on each side, the lowest 3in. to 6in. long, 1in. to 1½in. broad, lanceolate; pinnules oblong-rhomboidal, inciso-crenate or pinnatifid. *sori* copious, large. Himalayas. Greenhouse species. SYN. *Athyrium macrocarpum.*

A. macrophyllum (long-leaved). Synonymous with *A. nitens.*

A. marginatum (margined). *sti.* 2ft. to 3ft. long, strong, erect woody, about ¼in. thick at the base. *fronds* simply pinnate, 4ft. to 6ft. long; pinnæ in several opposite pairs, the lowest 1ft. to 2ft. long, 3in. to 4in. broad, the edge entire, the base often cordate. *sori* long, linear, confined to the free veins. Tropical America. Stove species. SYN. *Hemidictyum marginatum.*

A. marinum (sea).* Sea Spleenwort. *sti.* tufted, 3in. to 6in. long. *fronds* 6in. to 18in. long, 2in. to 4in. broad, oblong-lanceolate, apex pinnatifid; pinnæ of the lower half quite deltoid, the point acute or obtuse, margin crenato-dentate. *sori* broad, falling short of the edge. Europe, including Britain. Although quite hardy, this thrives better in a frame or cool house than in the open air.

A. m. coronans (crowned).* *fronds* 4in. to 6in. long, simply pinnate; pinnæ for two-thirds of the way up variable in form, and irregularly lobed and cut; the upper third freely branched with numerous imbricated, curled, and slightly crested divisions, forming a dense head 2in. or more across. A dwarf and pretty form.

A. m. crenatum (crenated). *fronds* 4in. to 8in. long, broadly-lanceolate; pinnæ nearly trapeziform, obtuse, with deeply crenated margins. A very pretty form.

A. m. mirabile (wonderful).* *sti.* 2in. to 4in. long. *fronds* about the same length, the rachis divided about half way down from the top into two nearly equal divisions, which are again freely forked, with the pinnules and segments obtusely lobed; the whole expanded, but not crested, into a breadth equal to the length of the frond; the lower pinnæ are more or less abnormal and bluntly lobed.

A. m. plumosum (feathery).* *sti.* 3in. to 4in. long. *fronds* 6in. to 15in. long, bi- or tripinnatifid, broadly-lanceolate; pinnæ very variable, closely set, and imbricated, cut nearly to the rachis into ovate or oblong divisions, which are again more or less deeply cut and lobed, the entire frond having a very elegant appearance.

A. m. ramo-plumosum (branched and feathery).* *fronds* divided nearly to the top of the stipes into two main branches, which are distinctly pinnate; pinnæ distant below, imbricated upwards, cut nearly to the rachis into ovate or oblong lobes, the margins of which are slightly dentated. It is a very handsome form, the width of the frond being greater than its length.

A. m. ramosum (branched). *fronds* from 4in. to 8in. long, branched at the apices; pinnæ oblong, with the margins obtusely-dentate, and slightly undulated.

A. m. sub-bipinnatum (half-bipinnate). *fronds* 6in. to 12in. long, lanceolate; pinnæ distant, deeply lobed, or cut nearly to the midribs. A very rare and pretty variety.

A. m. Thompsonii (Thompson's).* *sti.* 3in. to 4in. long, smooth. *fronds* 6in. to 10in. long, ovate-lanceolate, bipinnatifid; pinnæ closely set, sub-deltoid, unequal-sided, deeply cut into oblong, slightly undulated lobes below, gradually less divided upwards. A very rare and handsome variety. All the forms of *A. marinum* require a very moist atmosphere, consequently they will not thrive in the open air, unless along the sea-coast.

A. maximum (largest). *cau.* erect. *sti.* 2ft. or more long. *fronds* several feet long, 2ft. to 3ft. broad, deltoid-lanceolate, with numerous pinnæ on each side, the lowest 9in. to 18in. long, 4in. to 8in. broad; pinnules sub-sessile, 2in. to 4in. long, ¾in. broad; edge more or less lobed. *sori* medial, the lowest two lines long. North India. Stove species. SYNS. *A. diversifolium* and *Diplazium decurrens.*

A. melanocaulon (black-stiped).* *sti.* 1ft. to 2ft. long. *fronds* 2ft. to 3ft. long, 9in. to 18in. broad; lower pinnæ 4in. to 9in. long, 4in. to 6in. broad; pinnules lanceolate, 2in. to 3in. long, ¾in. broad, cut down two-thirds of the way to the rachis into linear-oblong, falcate, inciso-crenate lobes. *sori* short, oblong, not touching either midrib or edge. Fiji. Stove species. SYN. *Diplazium melanocaulon.*

A. Michauxii (Michaux's).* *cau.* stout. *sti.* 4in. to 8in. long. *fronds* 9in. to 24in. long, 3in. to 9in. broad, ovate-deltoid, bi- or tripinnate; pinnules oblong, deeply serrate, or cut quite to the rachis. United States. A very handsome hardy species, closely related to the Lady Fern, of which it may be only a variety.

A. monanthemum (one-flowered).* *sti.* densely tufted, 3in. to 6in. long. *fronds* 12in. to 18in. long, about 1in. broad, with twenty to forty horizontal, sessile, sub-dimidiate pinnæ on each side, which are about ½in. long and ¼in. deep, the upper side crenate, suddenly narrowed at the base, the lower more or less distinctly cut away in a straight, or, in the lower pinnæ, decurved line. *sori* linear-oblong, usually one or two, parallel with the lower edge of the pinnæ. Temperate regions of both hemispheres. Greenhouse species.

Asplenium—*continued.*

A. montanum (mountain).* *sti.* tufted, 2in. to 3in. long. *fronds* 2in. to 3in. long, 1in. broad, lanceolate-deltoid; lowest pinnæ distinctly stalked, deltoid, sharply serrated round the outer edge. *sori* short, copious. United States, 1812. Frame or greenhouse species.

A. multisectum (much-cut). Synonymous with *A. aspidioides.*

A. musæfolium (Musa-leaved). A variety of *A. Nidus.*

A. myriophyllum (myriad-leaved). A variety of *A. rhizophyllum.*

FIG. 172. ASPLENIUM NIDUS.

A. Nidus (nest).* Bird's-nest Fern. *fronds* undivided, 2ft. to 4ft. long, 3in. to 8in. broad, lanceolate, acute or acuminate at the apex, tapering gradually below into a short stem; the edge entire, the midrib rounded on the back; veins fine and parallel, about ¼in. apart. *sori* reaching about half way towards the margin. India, &c., 1820. SYN. *A. australasicum.* See Fig. 172.

A. N. australasicum (Australian). Midrib keeled on the back, often black. Australia, &c. The two former are best treated in the stove; the latter thrives well in the greenhouse. SYN. *Thamnopteris australasicum.*

A. N. musæfolium (Musa-leaved).* *fronds* larger, sometimes 6ft. long, 1ft. broad. *sori* extending nearly to the edge.

A. nitens (shining). *sti.* scattered, 6in. to 9in. long. *fronds* 1½in. to 2in. long, 6in. to 9in. broad, with twelve to twenty ascending or sub-falcate pinnæ on each side, which are 4in. to 6in. long, ¾in. to 1in. broad, much acuminated; edge finely toothed, base broadly rounded on the upper, truncate in a curve on the lower side. *sori* in close regular rows, not extending more than half way from the midrib to the edge. Mauritius. Stove species. SYN. *A. macrophyllum*, of gardens only.

A. nitidum (shining).* *sti.* 1ft. long, naked. *fronds* 2ft. to 3ft. long, 6in. to 12in. broad, with many lanceolate-deltoid pinnæ on each side, which are cut down to the rachis into numerous stalked deltoid pinnules, these are again cut into broad fan-shaped cuneate segments, sharply serrated round the outer edge. *sori* short. North India, Ceylon, &c. Greenhouse species.

A. novæ-caledoniæ (New Caledonian).* *sti.* tufted, 6in. to 12in. long. *fronds* 9in. to 12in. long, 6in. to 9in. broad, sub-deltoid, tripinnate; lower pinnæ and pinnules deltoid; segments rigid, scarcely flattened, ½in. or more long, distant, and erecto-patent. *sori* long, linear, marginal. New Caledonia. A rare greenhouse species. SYN. *Darea novæ-caledoniæ.*

A. obtusatum (obtuse). *sti.* tufted, 3in. to 6in. long. *fronds* 6in. to 12in. long, 3in. to 4in. broad, oblong or ovate-deltoid, with a terminal pinna not much longer than the others, and two to six pairs on each side, which are 1in. to 2in. long and about ½in. broad, obtuse, edge crenate, the base truncato-cuneate, shortly stalked. *sori* copious, broad, linear-oblong, falling short of the edge. Peru. *A. difforme* is a variety with an ovate-deltoid frond, and the pinnæ cut quite down to a narrow-winged rachis in the lower part into distinctly separated roundish or oblong-sinuated pinnules. New Zealand, Australia, &c. Greenhouse kinds.

A. o. lucidum (clear).* *fronds* often 2ft. long, with fifteen to twenty pairs of pinnæ on each side, which are more herbaceous in texture, darker green in colour, the lowest 6in. long, 1in. to 1½in. broad, narrowed gradually to a long acuminated point, edge more deeply toothed. Greenhouse variety. SYN. *A. lucidum.*

A. obtusifolium (obtuse-leaved).* *sti.* almost tufted, 6in. to 9in. long. *fronds* 12in. to 18in. long, 4in. to 6in. broad, ovate-lanceo-

Asplenium—*continued.*

late, with twelve to twenty stalked horizontal pinnæ on each side, which are 2in. to 3in. long, ¼in. to ⅜in. broad, acute; edges slightly undulato-crenate, the upper side with a distinct auricle at the base, and then narrowed suddenly, the lower side obliquely truncate. *sori* distant, in two regular rows, falling short of the edge. West Indies, &c., 1838. Stove species.

A. obtusilobum (obtuse-lobed).* *sti.* tufted, 2in to 4in. long. *fronds* 4in. to 6in. long, 1½in. to 2in. broad, with nine to twelve sub-deltoid pinnæ on each side, of which only the inner third on the lower side is cut away, the largest nearly 1in. long, ⅜in. broad; lowest pinnules ⅛in. deep, flabellately cut into three to five linear blunt lobes. *sori* sub-marginal. New Hebrides, 1861. A very pretty little stove species. SYN. *Darea obtusiloba.*

A. odontites (much-toothed). Synonymous with *A. flaccidum.*

A. oxyphyllum (sharp-leaved).* *sti.* firm, 6in. to 12in. long. *fronds* 1ft. to 2ft. long, 6in. to 12in. broad, lanceolate, with several pinnæ on each side, which are 3in. to 6in. long, 1in. to 2in. broad; pinnules lanceolate, in the larger forms again pinnatifid; teeth mucronate. *sori* in two rows on the pinnæ or pinnules midway between the midrib and edge. Himalayas. A very variable greenhouse species. SYNS. *Athyrium oxyphylla* and *Lastrea eburnea.*

A. paleaceum (scaly).* *sti.* densely tufted, 1in. to 3in. long, spreading, densely scaly. *fronds* 6in. to 9in. long, 1½in. to 2in. broad, sometimes proliferous and rooting at the apex, with twelve to twenty sub-sessile pinnæ on each side, which are 1in. long, about ¼in. broad, bluntish; edge incisodentate, the upper base auricled and narrowed suddenly, the lower obliquely-truncate; the lower ones stalked, and nearly as broad as long. *sori* linear, extending nearly to the edge. Tropical Australia. Stove or warm greenhouse species.

A. palmatum (palmate). Synonymous with *A. Hemionitis.*

A. parvulum (small). Synonymous with *A. trilobum.*

A. persicifolium (Peach-leaved). *sti.* and *rachis* grey, with a few scattered minute grey scales. *fronds* oblong-lanceolate, 2ft. to 3ft. long, often gemmiferous at the apex; pinnæ ascending, fifteen to thirty-jugate, sub-petiolate, 4in. to 5in. long, linear-ligulate-acuminate, ½in. to ⅝in. broad, distinctly crenate throughout. *sori* regular, reaching nearly to midrib and edge. Philippine and Sandwich Isles. Stove species.

A. Petrarchæ (Petrarch's).* *sti.* densely tufted, 1in. to 2in. long. *fronds* 2in. to 3in. long, ½in. broad, linear-lanceolate, with six to ten horizontal sessile pinnæ on each side, which are ¼in. long and nearly as much broad, cordate-ovate, blunt; edge sinuated; the base unequal, slightly truncate on the lower side. *sori* oblong, very short, four to six on each side of the midrib. South Europe, 1819. A very rare little gem, best treated in a cool house.

A. pinnatifidum (pinnatifid). *sti.* tufted, 2in. to 4in. long. *fronds* 3in. to 6in. long, 1in. or more broad at the base, lanceolate-deltoid, with a long, gradually narrowing point, which is sinuated only; the lobes below this ½in. to ½in. deep; the lowest ovate-oblong, ½in. deep by nearly as broad, sinuated and reaching down nearly to the rachis. *sori* copious. Pennsylvania. Greenhouse or sheltered places outside.

A. planicaule (flat-stiped).* *sti.* tufted, 3in. to 6in. long, naked. *fronds* 6in. to 12in. long, 2in. to 3in. broad, with twelve to twenty stalked horizontal pinnæ on each side, which are 1in. to 1½in. long, ½in. to ⅝in. broad, acute; edge lobed about half-way down, and deeply serrated. *sori* copious, reaching nearly to the edge. Himalayas, up to 6000ft., &c., 1841. Greenhouse species.

A. plantagineum (Plantain-like). *sti.* tufted, 6in. to 9in. long. *fronds* 6in. to 9in. long, 2in. to 3in. broad, simple, acuminate, base rounded; edge slightly undulato-dentate upwards, sometimes lobed towards the base. *sori* slender, linear, sometimes nearly touching both edge and midrib. West Indies, &c., 1819. Stove species. SYN. *Diplazium plantagineum.*

A. polyphyllum (many-leaved). Synonymous with *A. acuminatum.*

A. præmorsum (bitten). Synonymous with *A. furcatum.*

A. prolongatum (prolonged). Synonymous with *A. rutæfolium.*

A. pulchellum (pretty).* *sti.* tufted, 1in. to 2in. long. *fronds* 3in. to 6in. long, 1in. to 1½in. broad, with twelve to eighteen pinnæ on each side, which are ⅛in. to ⅜in. long, two lines to three lines broad, bluntish, almost dimidiate; the upper edge crenate, and narrowed suddenly at the base. *sori* linear, oblique, falling short of the edge. Tropical America. Stove species.

A. pumilum (small). *sti.* tufted, 3in. to 4in. long. *fronds* 4in. to 6in. each way, deltoid, the upper part sinuated only, the lower

Asplenium—*continued.*

cut down to the rachis into distinct pinnæ, of which the lowest pair are much the largest; the pinnules on the lower side sometimes 2in. long, reaching down to a slightly winged rachis, acuminate and deeply lobed. *sori* very oblique, the lower ones sometimes 1in. long. West Indies, &c., 1823. A very rare and pretty stove species.

A. rachirhizon (rachis-rooting). A variety of *A. rhizophorum.*

FIG. 173. ASPLENIUM RADICANS.

A. radicans (rooting). *cau.* erect, sub-arborescent. *sti.* 1ft. to 2ft. long, tufted. *fronds* 3ft. to 5ft. long, 2ft. to 3ft. broad, deltoid; lower pinnæ 12in. to 18in. long, 6in. to 8in. broad; pinnules lanceolate, sessile, the upper ones entire, lower ones 3in. to 4in. long, ⅜in. to 1in. broad, with blunt lobes, ¼in. broad, reaching about half way down to the rachis. Lower *sori* sometimes ½in. long. Tropical America. A very variable species. SYNS. *A. giganteum, Diplazium radicans, D. umbrosum,* &c. See Fig. 173.

A. refractum (refracted). A variety of *A. fontanum.*

A. resectum (cut or pared).* *sti.* scattered, 4in. to 8in. long. *fronds* 6in. to 15in. long, 2in. to 4in. broad, lanceolate-oblong, with ten to thirty sub-sessile horizontal pinnæ on each side, which are 1in. to 3in. long, ¼in. to ½in. broad, almost dimidiate, the point bluntish, all except the truncate part crenate, the upper half at the base narrowed nearly at a right angle. *sori* not reaching either the midrib or edge. India, &c., widely distributed, 1820. Greenhouse species.

A. rhizophorum (root-bearing).* *sti.* tufted, 4in. to 8in. long. *fronds* 1ft. to 2ft. long, 4in. to 6in. broad, elongated, and rooting at the apex; pinnæ twelve to thirty on each side, sub-sessile, 1½in. to 2in. long, about ½in. broad, inciso-dentate throughout; the two sides unequal, the upper one auricled and narrowed, the lower one obliquely cuneate. *sori* not reaching either to the edge or midrib. Tropical America. A very variable stove species. *A. r. rachirhizon,* has distinctly separated oblong-rhomboidal pinnules, again deeply cut into narrow segments.

A. rhizophyllum (leaf-rooting). *sti.* tufted, 2in. to 6in. long. *fronds* 6in. to 12in. long, 1½in. to 2in. broad, cut down into numerous close-placed horizontal pinnæ on each side; central ones 1in. long, ½in. to ⅝in. broad, cut down throughout nearly to the centre into simple or forked erecto-patent pinnules, the lowest on the under side suppressed. *sori* solitary, sub-marginal. *A. r. myriophyllum* is a variety with broader fronds; central pinnæ 1½in. long, with lower pinnules cut down into several simple or forked linear segments. North America, &c., 1680. Both handsome greenhouse kinds.

A. rutæfolium (Rue-leaved).* *sti.* tufted, 4in. to 9in. long. *fronds* 6in. to 15in. long, 2in. to 4in. broad, ovate deltoid, with twelve to twenty pinnæ on each side, the lowest sub-deltoid, 2in. or more long, cut down to the rachis into numerous erecto-patent distant pinnules on each side, the lowest on the upper side again cut down into erecto-patent linear segments. *sori* small, marginal. Cape Colony. A beautiful greenhouse species. SYNS. *A. prolongatum* and *Darea rutæfolia.*

A. Ruta-muraria.* Wall-rue. *sti.* tufted, 2in. to 4in. long. *fronds* 1in. to 2in. long, about 1in. broad, deltoid, cut down to the rachis into a few pinnæ on each side, the lower ones again cut

Asplenium—*continued.*

down into spathulato-cuneate pinnules, which are serrated round the outer edge. *sori* copious. Great Britain, and almost world-wide in its distribution. Hardy species. This requires a well-drained position, and a soil composed mainly of old mortar rubbish.

A. salicifolium (Willow-leaved). *sti.* tufted, 6in. to 12in. long. *fronds* 12in. to 18in. long, 6in. to 9in. broad, oblong, with a terminal pinna and four to ten distinctly stalked ones on each side, which are 4in. to 6in. long, ⅔in. to 1in. broad, acuminate; edge usually entire, the base equally truncato-cuneate on both sides. *sori* falling short both of the edge and midrib. West Indies, &c. Stove species.

A. Sandersoni (Sanderson's).* *sti.* tufted, 1in. to 2in. long. *fronds* 6in. to 9in. long, ½in. to ⅔in. broad, linear, often gemmiferous at the apex, with twelve to twenty horizontal dimidiate pinnæ on each side, which are deeply crenate on the upper edge, and at the base narrowed suddenly into a winged petiole, the lower one nearly straight and quite entire. *sori* oblong. Natal, &c. A very rare greenhouse species.

A. schizodon (cut-toothed). Synonymous with *A. Vieillardii.*

A. Schkuhrii (Schkuhr's). *cau.* erect. *sti.* 1ft. to 1½ft. long. *fronds* deltoid, 1½ft. to 2ft. long, tripinnatifid; lower pinnæ distant, oblong-lanceolate, 6in. to 8in. long, 1½in. to 2in. broad, rachis winged to base; pinnules ligulate-oblong, ⅜in. broad, sessile, cut into shallow, close, oblong blunt lobes. *sori* ⅛in., medial in a single row in the pinnules. Ceylon. Stove species. SYN. *Diplazium Schkuhrii.*

A. Selosii (Selose's).* *sti.* densely tufted, 1in. to 2in. long, wiry. *fronds* ½in. to ⅔in. long, palmately cleft, usually into three nearly equal forks, which are about one line broad, the edge slightly inciso-serrate. *sori* copious, ultimately occupying the whole surface. Tyrol and Carinthia. A very rare and curious little species, requiring the protection of the frame or cool house; it should be firmly potted between pieces of sandstone in loam, leaf-soil, rock chippings and sand, with good drainage.

A. septentrionale (northern).* *sti.* densely tufted, 3in. to 4in. long. *fronds* simple, or cleft from the apex into two or three cuneate divisions, 1in. to 1½in. long, one line broad, with a few sharp lateral and terminal teeth. *sori* elongated, copious, often at last hiding the whole under surface. Great Britain, and widely distributed in both hemispheres. This rare little species requires to be securely planted in a well-drained elevated chink of the fernery outside, in loamy, gritty soil.

A. Shepherdi (Shepherd's).* *sti.* tufted, 1ft. long. *fronds* 12in. to 18in. long, 6in. to 9in. broad; lower pinnæ stalked, 4in. to 6in. long, 1in. to 1½in. broad, point acuminate, edge lobed above, ½in. broad, somewhat toothed. *sori* linear, not reaching the edge. South America. Stove species. SYN. *Diplazium Shepherdi.*

A. S. inæquilaterum (unequal-sided). *fronds*, texture firm, colour duller than that of the type; pinnæ much acuminated; the lobes deeper, more uniform, and falcate, the two sides unequal, the lower one unequally truncate at the base.

A. spathulinum (spathulate). A synonym of *A. affine.*

A. spinulosum (very spiny).* *sti.* 6in. to 12in. long, scattered. *fronds* 9in. to 12in. each way, deltoid, tri- or quadripinnatifid, with nine to twelve pinnæ on each side, the lowest much the largest, 6in. to 9in. long, 2½in. to 3in. broad, ovate-lanceolate; pinnules lanceolate, cut down to the rachis on each side into six to nine oblong-rhomboidal mucronate segments, two lines long, one line broad, which are sharply toothed. *sori* two to ten to a segment, usually round, but occasionally oblong. Amur-land, &c. Greenhouse species. SYN. *Athyrium spinulosum* and *Cystopteris spinulosa.*

A. splendens (splendid). *rhiz.* creeping, scaly. *sti.* 6in. to 9in. *fronds* deltoid, 6in. to 1ft. long, two to three-pinnate; lower pinnæ stalked, deltoid, 1in. to 2in. broad, pinnate or bipinnate; segments cuneate-flabellate, ⅛in. to ¼in. broad, slightly lobed, sharply toothed round outer edge. *sori* copious, slender, irregular, reaching from base nearly to tip of segments. Cape Colony. A very rare greenhouse species.

A. subsinuatum (half-waved). Synonymous with *A. lanceum.*

A. sundense (Sundanese). Synonymous with *A. vittæforme.*

A. sylvaticum (woods). *cau.* decumbent. *sti.* 1ft. long. *fronds* 1ft. to 2ft. long, 4in. to 8in. broad, ovate-lanceolate, with numerous spreading pinnæ, the largest 3in. to 4in. long, ½in. to ⅔in. broad, acuminated; edge broadly and briefly lobed; base narrowed suddenly on both sides. *sori* in long slender lines, reaching nearly to the edge. India, &c. Stove species.

A. thelypteroides (Thelypteris-like). *sti.* 1ft. long. *fronds* 1ft. to 2ft. long, 6in. to 12in. broad, lanceolate, with numerous spreading pinnæ, the lower ones 4in. to 6in. long, 1in. broad, cut down to a broadly-winged rachis into numerous nearly entire elliptical spreading pinnules. *sori* in close regular rows, reaching nearly from the midrib to the edge, slightly curved, the lower ones often double. North America, &c., 1823. Hardy or cool house species. SYN. *Athyrium thelypteroides.*

A. Thwaitesii (Thwaites's).* *rhiz.* wide-creeping, stout. *sti.* 6in. long, slender, densely clothed with strong white woolly hairs. *fronds* 1ft. or more long, 4in. to 6in. broad, with eight to ten distinct pinnæ beneath the pinnatifid apex, the largest 3in. long, ⅜in. broad, cut down two-thirds of the way to the rachis in oblong crenulated lobes, ¼in. deep, two lines across. *sori* reaching half-way to the edge, the lowest about one line long. Ceylon. Very fine stove species. SYN. *Diplazium Thwaitesii.*

FIG. 174. ASPLENIUM TRICHOMANES.

A. Trichomanes (maiden-hair).* Maidenhair Spleenwort. *sti.* densely tufted, 1in. to 4in. long. *fronds* 6in. to 12in. long, about ½in. broad, with fifteen to thirty opposite pairs of sessile horizontal pinnæ, which are ¼in. to ⅜in. broad, one and a-half to two lines deep, edge slightly crenate, the two sides unequal, the upper one the broadest, and narrowed suddenly at the base. *sori* linear-oblong, three to six on each side of the midrib. Great Britain, and almost cosmopolitan. Hardy species. See Fig. 174. There are several varieties in cultivation, of which the following are the most important:

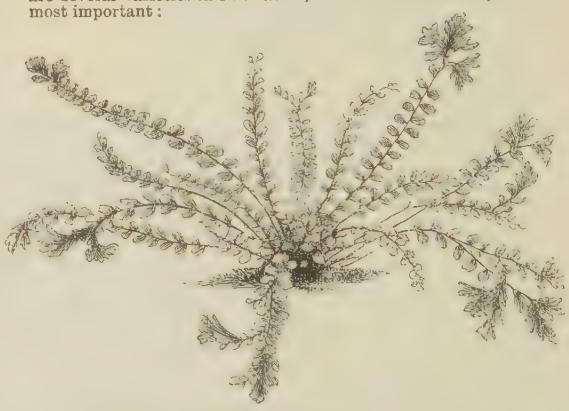


FIG. 175. ASPLENIUM TRICHOMANES CRISTATUM.

A. T. cristatum (crested).* *fronds* 4in. to 6in. long, simply pinnate, with roundish pinnæ, and broad crests at their extremities, sometimes divided, each fork crested. A very pretty little variety, requiring frame or greenhouse treatment. See Fig. 175.

A. T. incisum (deeply-cut).* *fronds* 3in. to 6in. long; pinnæ deeply pinnatifid, the lobes again deeply cut or serrated. A very rare and pretty form.

A. T. multifidum (much-divided).* *fronds* 3in. to 6in. long, once, twice, thrice, or, rarely, quadri-furcate, each division terminated with a little crest. A free-growing kind.

A. T. ramosum (branched).* *fronds* 5in. to 8in. long, freely branched, each division being again forked; pinnæ deeply cut or crenated, or serrate. More hardy than any of the other forms.

A. trilobum (three-lobed).* *sti.* tufted, 2in. to 3in. long. *fronds* 1in. to 1½in. long, 1in. broad, rhomboidal, apex acute, base cuneate, entire, the margin undulato-crenate, or the lower part deeply lobed, with broad inciso-crenate divisions. *sori* broad and short. Chili and South Brazil. A very rare little stove species. SYN. *A. parvulum.*

A. umbrosum (shady). *sti.* 1ft. or more long, scaly at the base. *fronds* 2ft. to 5ft. long, 12in. to 18in. broad, ovate-deltoid; pinnæ ovate-lanceolate, 6in. to 9in. long, 3in. to 6in. broad, with laceolate pinnules, which are again cut down to the midribs into unequal-sided rhomboidal lobes, with the margins sharply crenated. *sori* copious, oblong, with large tumid membranous involucres. Madeira, Canaries, Himalayas, &c. Very widely distributed. A very handsome greenhouse species. SYNS. *Allantodia australe, Athyrium umbrosum.*

A. varians (variable). *sti.* tufted, 1in. to 3in. long. *fronds* 4in. to 6in. long, 1in. broad, oblong-lanceolate, with eight to twelve

Asplenium—*continued.*

pairs of pinnæ on each side, lower ones sub-deltoid, ½in. to ⅔in. long, ¼in. broad, cut down to the rachis into a few cuneato-flabellate pinnules, the lowest two lines across, sharply toothed on the outer edge. *sori* copious, when mature, covering nearly the whole under surface of the pinnules. Himalayas, and widely distributed. Greenhouse species.

A. Veitchianum (Veitch's). Synonymous with *A. Belangeri.*

A. Vieillardii (Vieillard's).* *sti.* tufted, 4in. to 6in. long. *fronds* 6in. to 9in. long, 6in. to 8in. broad, with large linear-lanceolate terminal pinna, lengthened out at the point, and deeply serrated, and three to four pairs of erecto-patent similar lateral ones, which are 3in. to 4in. long, upwards of ½in. broad, equally truncato-cuneate, and the lower ones slightly stalked at the base. *sori* distant, falling short of both edge and margin. New Caledonia. A very graceful greenhouse species. SYN. *A. schizodon. A. apicidens* is but a variety of this, with shortened sori and more obtuse venation.

FIG. 176. ASPLENIUM VIRIDE, showing Barren and Fertile Pinnæ (*a* and *b*), Sorus (*c*), and Sporangium (*d*).

A. viride (green).* Green Spleenwort. *sti.* densely tufted, 2in. to 4in. long. *fronds* 4in. to 6in. long, ½in. broad, with twelve to twenty sub-sessile pinnæ on each side, ovate-rhomboid; upper edge narrowed suddenly at the base, the lower one obliquely truncate, outer part deeply crenated. *sori* copious, linear-oblong, oblique. Great Britain, &c., widely distributed in both hemispheres. It requires to be planted in a well-drained but moist situation. Hardy species. See Fig. 176.

A. vittæforme (narrow-fronded).* *rhiz.* creeping. *sti.* short, erect. *fronds* entire, lanceolate, 12in. to 18in. long, 1½in. to 3in. broad, narrowed to an acute point, and very gradually into the stem below; margin obscurely toothed. *sori* copious, often reaching from the midrib nearly to the edge. Java, &c. Stove species. SYN. *A. sundense.*

A. viviparum (plant-bearing).* *sti.* tufted, 6in. to 9in. long. *fronds* 1ft. to 2ft. long, 6in. to 8in. broad, ovate-lanceolate, with numerous close-placed erecto-patent pinnæ on each side, which are 3in. to 4in. long, 1½in. to 2in. broad, cut down to a compressed

Asplenium—*continued.*

rachis into numerous pinnatifid pinnules, the lower segments of which are again forked; ultimate segments ½in. to ⅔in. long, quarter-line broad. *sori* solitary, marginal. Mauritius, &c., 1820. A very handsome stove species.

A. vulcanicum (volcanic). *sti.* 6in. to 9in. long. *fronds* 1ft. to 2ft. long, 4in. to 8in. broad, oblong-lanceolate, with a linear-terminal pinna, or gemmiferous at the apex, and six to twelve lateral ones on each side; lower ones stalked, 2in. to 4in. long, ⅔in. to 1in. broad, acuminated; edge slightly dentate; the base truncate. *sori* very regular and parallel, falling short of the edge. Malay Islands. Stove species. SYN. *A. heterodon.*

A. zeylanicum (Ceylonese).* *sti.* scattered, 4in. to 8in. long. *fronds* 6in. to 12in. long, 1in. to 2in. broad, the point acuminated, apex slightly lobed, the lower two-thirds more deeply so, and the base quite down to the rachis; lobes blunt, ½in. to ¼in. across. *sori* linear, two to three lines long. Ceylon. Stove species. SYN. *Diplazium zeylanicum.*

ASSONIA (commemorative of Ignatius de Asso, a distinguished Spanish botanist, who wrote on the plants of Arragon). ORD. *Sterculiaceæ.* This genus is now included by best authorities under *Dombeya.* Ornamental stove evergreen trees, with undivided leaves, and axillary, bifid, sub-corymbose peduncles. They are of easy culture; thriving freely in any light rich soil, or a mixture of loam and peat. Young cuttings will root freely in sand, with a brisk bottom heat, if covered by a bell glass.

A. populnea (Poplar-leaved). *fl.* white, disposed in a terminal, bifid corymb; peduncles scarcely longer than the petioles. June. *l.* cordate, acuminated, smooth, a little serrated. *h.* 10ft. to 20ft. Bourbon, 1820.

A. viburnoides (Viburnum-like). *fl.* white; peduncles three times longer than the petioles. *l.* cordate, somewhat acuminate, crenated, tomentose beneath, as well as younger leaves. *h.* 10ft. to 20ft. Bourbon, 1822.

ASTARTEA (a mythological name: Astarte, the Syrian Venus). ORD. *Myrtaceæ.* An ornamental greenhouse evergreen shrub, requiring a mixture of loam, peat, leaf soil, and sand. Young cuttings root readily in sand under a bell glass in gentle heat.

A. fascicularis (bundle-flowered). *fl.* white, pedicellate, solitary, axillary. May. *l.* opposite, linear, fleshy; when young, disposed in axillary fascicles. *h.* 6ft. to 9ft. West Australia, 1830.

ASTELMA (from *a*, not, and *stelma*, a crown; in reference to the construction of the fruit). ORD. *Compositæ.* Greenhouse evergreen shrubs from the Cape of Good Hope. Some species of this genus, which is now generally referred to *Helipterum*, are very handsome, and thrive well in a mixture of fibrous peat, leaf soil, and sand, with thorough drainage. Fill the pots one-third full of crocks; water carefully, and only when absolutely necessary; and place in a situation near the glass, allowing a free admission of air. Seeds should be sown in pots of light, open soil, and placed in a gentle heat; half-ripened cuttings will strike readily in sandy soil with a hand glass placed over them. They are now but rarely seen under cultivation.

A. canescens (hoary). *fl.-heads* purple; scales of involucre ovate; branches one-flowered. May to June. *l.* oblong, blunt, imbricated. *h.* 1½ft. 1794.

A. eximium (fine).* *fl.-heads* crimson; corymbs sessile. July. *l.* sessile, ovate, close, erect, white with thick woolly pubescence. Stem stout. *h.* 3ft. 1793. This is a very beautiful species.

A. speciosissimum (showiest). *fl.-heads* white, large, solitary, terminal. July. *l.* sessile, lanceolate-obovate, acute, three-nerved, woolly. *h.* 8ft. 1691.

ASTEPHANUS (from *a*, without, and *stephanos*, a corona; corona absent). ORD. *Asclepiadeæ*. A genus of pretty evergreen greenhouse twiners. Flowers few, small, disposed in interpetiolar umbels; corolla campanulate. Leaves small, opposite. They thrive in a compost of turfy peat, leaf soil, and loam, in equal parts. Very little water is required when the plants are at rest. Cuttings root readily in sandy soil in a moderate heat. Propagation may also be effected by division.

A. linearis (linear). *fl.* white, ; umbels dividing in threes, lateral and terminal. July. *l.* 1in. long, opposite, linear-lanceolate. Stem glabrous. Cape of Good Hope, 1816.

A. triflorus (three-flowered).* *fl.* white; umbels generally three-flowered. July. *l.* opposite, lanceolate, villous beneath. Stems hairy. Cape of Good Hope, 1816.

ASTER (from *aster*, a star; general shape of flower-heads). Michaelmas Daisy; Star-wort. SYN. *Pinardia* (of Necker). ORD. *Compositæ*. Hardy herbaceous perennials, except where otherwise stated. Heads solitary, corymbose, or panicled, heterogamous, rayed; ray florets pistiliferous, one or two-seriate, fertile or neuter; ligule elongated, white, blue, or purple; disk florets hermaphrodite, fertile, tubular, yellow, five-cleft; involucre campanulate or hemispheric; bracts few or many-seriate, outer smaller or larger; receptacle flat or convex; pappus hairs few or copious, scabrid, outer sometimes shorter, rigid, and paleaceous. Leaves alternate. This large genus contains many handsome border and alpine deciduous perennials (rarely biennials) of easy culture in ordinary soil. They may be propagated by divisions in autumn or spring, or by seeds in spring. The greenhouse species are mostly evergreen shrubs, requiring a compost of peat, leaf soil, and loam. Cuttings root readily in a sandy soil, under a hand glass, with very little heat.

A. acris (acrid). *fl.-heads* blue; involucre imbricated, twice as short as the disk. August. *l.* linear-lanceolate, not dotted, three-nerved. *h.* 2ft. South Europe, 1731.

A. acuminatus (taper-pointed).* *fl.-heads* white; panicle corymbose. September. *l.* broad-lanceolate, narrowed at base, entire, with a very long point. Stem simple, flexuous, angular. *h.* 2ft. North America, 1806.

A. adulterinus (false). *fl.-heads* violet; involucre squarrose, shorter than the disk. September. *l.* amplexicaul, lanceolate; lower ones sub-serrate, smooth; those of the branches linear squarrose. *h.* 3ft. North America.

A. æstivus (summer-flowering).* *fl.-heads* blue. July. *l.* lanceolate, somewhat amplexicaul, narrowed at the end, scabrous at edge. Stem erect, hispid; branchlets pilose. *h.* 2ft. North America, 1776.

A. albescens (whitish). *fl.-heads* purple or whitish, nearly 1in. across; corymbosely panicled; scales of involucre ovate-linear, apiculate; ray twenty-flowered. August. *l.* lanceolate on short petioles, denticulate, downy. Plant beset with rusty down. *h.* 3ft. Nepal, 1842.

A. alpinus (alpine).* *fl.-heads* bright purple, 1in. to 2in. across; scales of involucre nearly equal, lanceolate, bluntish. July. *l.*, radical ones lanceolate-spathulate; those of the stem lanceolate. Stem one-flowered. *h.* 6in. to 9in. Europe, 1658. A very attractive species, having a dwarf, stout habit; it forms a useful and handsome subject for edging, and its flowers are valuable for cutting purposes. See Fig. 177.

A. a. albus (white).* *fl.-heads* white, in other respects resembling the type; but it is much less desirable, and has not nearly so vigorous a habit. Europe, 1827.

A. altaicus (Altaian).* *fl.-heads* blue-purple, about 2in. across; stem simple, corymbose, downy. June, July. *l.* linear-lanceolate, entire, blunt mucronate, three-nerved at base, veiny. *h.* 1ft. Siberia, 1804. This, which is frequently considered a variety of *A. alpinus*, is one of the handsomest.

A. alwartensis (Alwart). *fl.-heads* red; ray very fine; involucre loosely squarrose. May. *l.* ovate, narrowed at base, entire, about five-nerved. *h.* 1ft. Caucasus, 1807.

A. Amellus (Amellus).* *fl.-heads* purple, solitary, numerous; involucre imbricated squarrose; leaves blunt; inner membranous, coloured at edge. August. *l.* oblong-lanceolate, scabrous. *h.* 2ft. Italy, 1596. One of the best border kinds; also suitable for rockeries.

Aster—*continued.*

FIG. 177. ASTER ALPINUS.

A. A. bessarabicus (Bessarabian).* A most desirable variety, frequently seen in gardens; it is rather taller than the type, with larger flower-heads, of a deep purple colour. One of the showiest of all the Asters. See Fig. 178.

FIG. 178. ASTER AMELLUS BESSARABICUS.

A. amplexicaulis (stem-clasping). *fl.-heads* violet. July. *l.* ovate-oblong, acute, amplexicaul, cordate, serrated, smooth. Stem panicled, smooth; branches one to two-headed. *h.* 3ft. North America.

Aster—*continued.*

A. amygdalinus (Almond-leaved). *fl.-heads* white; involucre closely imbricated. August. *l.* lanceolate, narrowed at base, acuminated, scabrous at edge. Stem simple, corymbose at end. *h.* 2ft. North America, 1759.

A. argenteus (silvery).* *fl.-heads* purple. August. *l.* oblong-lanceolate, silky, sessile. Stem slender, decumbent, loosely branched; branches and branchlets one-headed. *h.* 1ft. North America, 1801.

A. bellidiflorus (Daisy-flowered). *fl.-heads* pale red; involucre with spreading scales. September. *l.* amplexicaul, narrow-lanceolate, scabrous above, lower sub-serrated. Stem much branched. *h.* 3ft. North America.

A. Bigelovii (Bigelow's).* *fl.-heads* corymbose, 2½in. diameter, ray-florets lilac, disk yellow. Summer. *l.* scabrous pubescent, oblong-spathulate; cauline ones amplexicaul, ovate-oblong, crenate, obscurely-toothed *h.* 2½ft. Colorado, 1878. A very handsome biennial species. SYN. *A. Townshendi.*

A. blandus (charming). *fl.-heads* pale purple; racemes scarcely longer than the leaves. October. *l.* sub-amplexicaul, oblong-lanceolate, acuminate, sessile, smooth. Stem pyramidal. *h.* 2ft. North America, 1800.

A. canescens (hoary). *fl.-heads* pale purple; involucre imbricated, very acute, longer than disk. September. *l.* linear. Panicle corymbose, much branched, leafy. *h.* 2ft. North America, 1812. Biennial or perennial.

A. cassiarabicus (Arabian Cassia). *fl.-heads* pink; panicles corymbose. September. *l.* ovate, acute, serrated, tapering at the petioles. Plant erect, pilose. *h* 2ft. Russia, 1834.

A. caucasicus (Caucasian).* *fl.-heads* purple, solitary; scales of involucre nearly equal, linear. July. *l.* ovate, sessile, scabrous. *h.* 1ft. Caucasus, 1804.

A. ciliatus (ciliated). *fl.-heads* white. September. *l.* ciliated; cauline ones linear-lanceolate, nerved; those of the branches very short lanceolate, three-nerved. Stem branched, downy; branches downy. *h.* 3ft. North America.

A. concinnus (neat).* *fl.-heads* purple; involucre closely imbricated. October. *l.* sub-amplexicaul, lanceolate; lower ones sub-serrate, smooth. Stem simple, panicled at end. *h.* 2ft. North America, 1800.

A. concolor (one-coloured). *fl.-heads* purple; raceme terminal. October. *l.* oblong-lanceolate, hoary on each side. Stem simple, erect, downy. *h.* 1ft. North America, 1759.

A. conyzioides (Conyza-like). Synonymous with *Sericocarpus conyzioides.*

A. cordifolius (heart-leaved). *fl.-heads* blue, small, disposed in crowded racemes, which are slightly drooping. July. *l.* cordate, pilose beneath, finely serrated, stalked. Stem smoothish, panicled; panicle spreading. *h.* 2ft. North America, 1759.

A. coridifolius (Coris-leaved). *fl.-heads* pale blue. October. *l.* very numerous, linear, blunt, reflexed, hispid at edge. Stem branched, diffuse, smooth; branches one-headed. *h.* 1ft. North America.

FIG. 179. ASTER CORYMBOSUS, showing Habit and Flower-head.

A. corymbosus (corymbose). *fl.-heads* corymbose, about 1in. in diameter; ray-florets few, narrow, white; disk-florets pale yellow. Autumn. *l.* 3in. long, cordate acute, lobed at the base, coarsely toothed. Stems brittle, blackish purple. *h.* 2ft. to 3ft. SYN. *Biotia corymbosa.* See Fig. 179.

A. diffusus (diffuse). *fl.-heads* white; involucres imbricated. October. *l.* elliptic-lanceolate, equal, serrated, smooth. Branches spreading. Stem pubescent. *h.* 2ft. North America, 1777.

A. Douglasii (Douglas's).* *fl.-heads* purple; involucral scales linear or spathulate-linear, loosely imbricated. August. *l.* lanceolate, acute, entire, or rarely serrate, mostly tapering at the base. Stem smooth, slender, paniculately branched, leafy. *h.* 3ft. to 4ft. California, &c.

A. dracunculoides (Tarragon-like).* *fl.-heads* white, about 1in. across, disposed in dense cymose clusters; involucre imbricated. September, October. *l.* linear, acuminated, entire; lower ones linear-lanceolate, sub-serrate. Branches corymbose. *h.* 3ft. North America, 1811. A very handsome species.

A. dumosus (bushy).* *fl.-heads* white, about ½in. across, disposed in broad clusters; involucre cylindrical, closely imbricated. October. *l.* linear, glabrous; those of the branches very short. Branches panicled. *h.* 2ft. North America, 1734.

A. d. albus (white).* *fl.-heads* quite white, and rather smaller than those of the species. North America.

A. d. violaceus (violet). *fl.-heads* violet-purple. North America.

A. elegans (elegant). *fl.-heads* blue, small; corymb contracted, drooping; scales of involucre oblong-cuneate, blunt, squarrose. September. *l.* scabrous; cauline ones oblong-lanceolate, acute; radical ones oblong, stalked. *h.* 2ft. North America, 1790. A very elegant species, having a graceful habit.

A. eminens (eminent). *fl.-heads* light blue. October. *l.* linear-lanceolate, acuminate, scabrous at edge; lower ones sub-serrated. Stem panicled; branches one-headed. *h.* 2ft. North America.

FIG. 180. ASTER ERICOIDES.

A. ericoides (Heath-like).* *fl.-heads* white; involucre squarrose, leaflets acute. September. *l.* linear, glabrous; those of the branches subulate, close together; and those of the stem long. *h.* 3ft. North America, 1758. A very pretty species. See Fig. 180.

A. floribundus (many-flowered).* *fl.-heads* light purple September. *l.* sub-amplexicaul, lanceolate; lower ones serrated. Stem smooth; branches corymbose. *h.* 4ft. North America.

A. foliosus (leafy). *fl.-heads* pale blue; involucre imbricate. September. *l.* linear-lanceolate, acuminate, narrowed at each end.

Aster—*continued.*

Stem downy, panicled, erect; branches few-headed. *h.* 3ft. North America, 1732.

A. fragilis (fragile). *fl.-heads* flesh-coloured, small; involucre imbricated. September. *l.* linear, acuminate, entire; radical ones oblong, serrate. Branches in corymbose panicles. *h.* 2ft. North America, 1800.

FIG. 181. ASTER GRANDIFLORUS.

A. grandiflorus (large-flowered).* *fl.-heads* purple, large, terminal; scales of involucre squarrose. November. *l.* linear, rigid, acute, sub-amplexicaul; those of the branches reflexed, hispid at edge. *h.* 2ft. North America, 1720. See Fig. 181.

A. hyssopifolius (Hyssop-leaved).* *fl.-heads* white, or purple shaded; scales of the involucre about half as long as the disk. August to October. *l.* linear-lanceolate, acute, with the margins scabrous. Branches fastigiate and corymbose, smooth. *h.* 1½ft. to 2ft. North America.

A. lævigatus (smooth-stemmed). *fl.-heads* flesh-coloured, about 1in. across, disposed in large panicles. September. *l.* sub-amplexicaul, broad-lanceolate, sub-serrate, smooth. Stem glabrous. Branches many-headed. *h.* 3ft. North America, 1794.

A. lævis (smooth).* *fl.-heads* blue; involucre imbricated with cuneiform leaflets. September. *l.* sub-amplexicaul, remotely oblong, entire, lucid; radical ones sub-serrated. *h.* 2ft. North America, 1758. One of the best border species.

A. laxus (loose-flowered). *fl.-heads* white, about 1in. across; clusters loose. October. *l.* linear-lanceolate, scabrous at edge; lower ones sub-serrated; stem ones reflexed. Stem loosely panicled. *h.* 2ft. North America.

A. linarifolius (Toad-flax-leaved). *fl.-heads* pale blue. September. *l.* numerous, linear, mucronated, nerveless, not dotted, keeled, scabrous, rigid. Branches fastigiate, one-headed. *h.* 1ft. North America, 1699.

A. linifolius (Flax-leaved). *fl.-heads* white; involucre imbricated, short. July. *l.* linear, nerveless, dotted, scabrous, reflexed, spreading. Branches corymbose, fastigiate, leafy. *h.* 2ft. North America, 1739.

A. longifolius (long-leaved).* *fl.-heads* white, 1in. across, in dense corymbose panicles; involucre squarrose. October. *l.* linear-lanceolate, rarely toothed, very long, smooth. *h.* 3ft. North America, 1798. There are several varieties of this handsome species.

A. l. formosus (charming).* *fl.-heads* pink, produced in dense corymbs. *h.* 1½ft. to 2ft.

A. macrophyllus (large-leaved). *fl.-heads* white. August. *l.* large, ovate, stalked, serrated, scabrous; upper ones cordate, sessile. Stem branched, diffuse. *h.* 2ft. North America, 1739.

A. multiflorus (many-flowered).* *fl.-heads* white, small; corymb large, elongated; involucre imbricated; scales oblong, squarrose,

Aster *–continued.*

acute. September. *l.* linear, glabrous. Stem much branched, diffuse, downy; branchlets one-sided. *h.* 3ft. North America, 1732.

A. myrtifolius (Myrtle-leaved). *fl.-heads* white; involucre imbricated; scales length of disk. August. *l.*, stem ones, amplexicaul, scabrous; those of the branches small. *h.* 2ft. 1812.

A. novæ-angliæ (New England).* *fl.-heads* purple, in terminal clusters. September. *l.* linear-lanceolate, pilose, amplexicaul, auricled at base. Stem simple, pilose, straight. *h.* 6ft. North America, 1710. One of the best; having a tall and robust habit.

A. n.-a. rubra (red).* *fl.-heads* deep red pink, in other respects like the type. North America, 1812.

A. novæ-belgii (New York).* *fl.-heads* pale blue. September. *l.* sub-amplexicaul, lanceolate, glabrous, scabrous at edge; lower ones sub-serrated. Branches divided. *h.* 4ft. North America, 1710. There is a variety known in gardens which belongs to this species, under the name of *amethystinus*, the flowers of which are much larger and very showy.

A. obliquus (oblique). *fl.-heads* numerous; ray white; disk purplish. Autumn. *l.* alternate; lower ones linear-lanceolate, oblique; upper stem ones smaller. *h.* 5ft. North America. A very fine species, forming large tufts.

A. paniculatus (panicled).* *fl.-heads* light blue; involucre loose. September. *l.* ovate-lanceolate, sub-serrated, stalked, smooth; petioles naked. Stem much branched, smooth. *h.* 4ft. North America, 1640.

A. pannonicus (Pannonian). *fl.-heads* violet; scales of involucre lanceolate, blunt, equal. July. *l.* linear-lanceolate, hispid at edge. Stem simple, corymbose. *h.* 2ft. Hungary, 1815.

A. patens (spreading). *fl.-heads* light purple, about 1in. across. October. *l.* oblong-lanceolate, ciliate, cordate, amplexicaul, scabrous on each side, hairy. Stem branched, hairy. *h.* 2ft. North America, 1773.

A. pendulus (drooping).* *fl.-heads* pure white at first, ultimately rosy pink, small. September. *l.* elliptic-lanceolate, serrate, smooth, those of the branches distant. Branches much spreading, pendulous. *h.* 2ft. North America, 1758. A very pretty species.

A. peregrinus (foreign).* *fl.-heads* bluish purple, 2in. across; July, August. *l.* lanceolate, sub-acute, entire, smooth, those of the stem rather narrower than the radical ones. Stem smooth, or nearly so, two or three-flowered. *h.* 1ft. North America. A very pretty little species for the rockery or border.

A. pilosus (pilose). *fl.-heads* pale blue; involucre oblong, loose, imbricated. September. *l.* linear-lanceolate, hoary. Stem branched, villous; branchlets somewhat one-sided, one-headed. *h.* 2ft. North America, 1812.

A. præcox (early). *fl.-heads* violet; involucre imbricated; scales nearly equal; outer scales somewhat spreading. July. *l.* oblong-lanceolate, narrowed at the base. Stem hairy. *h.* 2ft. North America, 1800.

A. pulchellus (beautiful).* *fl.-heads* purple, solitary; scales of involucre nearly equal, linear, acuminate. June. *l.*, radical ones spathulate; cauline ones linear-lanceolate. *h.* 1ft. Armenia.

A. puniceus (red-stalked). *fl.-heads* blue, about 1in. across; panicle large, pyramidal; involucre loose, longer than the disk. September. *l.* amplexicaul, lanceolate, serrate, roughish. Branches panicled. *h.* 6ft. North America, 1710.

A. pyrenæus (Pyrenean).* *fl.-heads* lilac-blue (disk yellow), large, three to five in a short corymb. July. *l.* scabrous on both sides; cauline ones oblong-lanceolate, acute, sessile, sharply serrated on the upper part. *h.* 1ft. to 1½ft. Pyrenees.

A. Reevesi (Reeves's). *fl.-heads* white, with yellow centre, small; panicle dense, pyramidal. Autumn. *l.* linear, acute. Branches slender. *h.* 9in. to 12in. North America. A very desirable species, suitable for rockwork.

A. reticulatus (netted). *fl.-heads* white. July. *l.* lanceolate-oblong, acute at each end, sessile, revolute at end, netted, and three-nerved beneath. Plant hoary all over. *h.* 3ft. North America, 1812.

A. rubricaule (red-stemmed). Synonymous with *A. spurius*.

A. salicifolius (Willow-leaved). *fl.-heads* flesh-coloured; involucre lanceolate, imbricate; scales acute, spreading at end. September. *l.* linear-lanceolate, nearly entire, smooth. Stem smooth, panicled at end. *h.* 6ft. North America, 1760.

A. salsuginosus (salt-plains).* *fl.-heads* violet-purple; involucral scales linear, loose, glandular. July. *l.* entire, the lower spathulate, obovate, tapering into a margined petiole; the upper ones lanceolate, acute, with broad base, usually sub-amplexicaul. Stem minutely pubescent, leafy nearly to the top, few-flowered. *h.* 9in. to 18in. North America, 1827. A very handsome species.

A. s. elatior (tallest). This variety grows 2ft. or more high, and has rather larger flowers than the type. North America.

A. sericeus (silky). *fl.-heads* deep blue; terminal, about 1½in. across. Summer and autumn. *l.* oblong-lanceolate, sessile, entire, three-nerved, silky with down. *h.* 3ft. Missouri, 1802. This is a half-hardy evergreen shrub, and requires a warm, well-drained soil.

A. serotinus (late-flowering). *fl.-heads* blue. September. *l.* oblong-lanceolate, acuminate, sessile, smooth, scabrous at edge; lower

Aster—*continued.*

ones serrated; branches corymbose, smooth. *h.* 3ft. North America.

A. Shortii (Short's). *fl.-heads* purplish blue, about 1in. across; panicles long, racemose, Autumn. *l.* lanceolate, elongated, acuminated, cordate at the base. *h.* 2ft. to 4ft. Stem slender, spreading. North America.

A. sibiricus (Siberian). *fl.-heads* blue; involucre loose; leaflets lanceolate, acuminate, hispid. August. *l.* lanceolate, sub-amplexicaul, serrate, pilose, scabrous. *h.* 2ft. Siberia, 1768.

A. sikkimensis (Sikkimese).* *fl.-heads* purple; leaflets of involucre linear, acuminate, sub-squarrose. October. *l.* lanceolate, acuminate, spinosely denticulate; radical ones on longer petioles; cauline ones sessile; corymbs large, of many heads, leafy, erect, glabrous, branched. *h.* 3ft. Sikkim, 1850.

A. spectabilis (showy).* *fl.-heads* blue; scales of involucre loose, leafy. August. *l.* lanceolate, roughish, somewhat amplexicaul; lower ones serrate in the middle. *h.* 2ft. North America, 1777. A very pretty species.

A. spurius (spurious). *fl.-heads* purple, large, few; inner scales of involucre coloured. September. *l.* linear-lanceolate, amplexicaul, polished. Stem virgate, panicled. Branches racemose. *h.* 4ft. North America, 1789. SYN. *A. rubricaule.*

A. tardiflorus (late-flowering). *fl.-heads* blue, numerous. Autumn. *l.* sessile, serrated, smooth, spathulate-lanceolate, narrowed at base, and bent down towards each side. *h.* 2ft. North America, 1775.

A. Townshendi (Townshend's). Synonymous with *A. Bigelovii.*

A. Tradescanti (Tradescant's).* *fl.-heads* white; involucre imbricated. August. *l.* lanceolate-sessile, serrated, smooth; branches virgate. Stem round, smooth. *h.* 3ft. North America, 1633. *A. multiflorus* is very much like this species, and, perhaps, a mere form thereof, with somewhat smaller flowers and more obovate-oblong leaves.

A. tripolium (Tripoli). Michaelmas Daisy. *fl.-heads* blue; disk yellow; scales of involucre lanceolate, membranous, obtuse, imbricated. August. *l.* linear-lanceolate, fleshy, obscurely three-nerved. Stem glabrous, corymbose. *h.* 2ft. Britain.

FIG. 182. ASTER TURBINELLUS.

A. turbinellus (turbinate). *fl.-heads* delicate mauve, disposed in panicles; involucre top-shaped, scales imbricate. Summer and

Aster—*continued.*

autumn. *l.* lanceolate, smooth, entire, with fringed margins, somewhat stem-clasping; those of the branchlets awl-shaped. *h.* 2ft. to 3ft. North America. A very desirable species. See Fig. 182.

A. undulatus (undulated). *fl.-heads* pale blue. August. *l.* oblong-cordate, amplexicaul, entire; petioles winged. Stem panicled, hispid. Branchlets one-sided. *h.* 3ft. North America, 1699.

A. versicolor (various-coloured).* *fl.-heads* white, changing to purple; scales of involucre shorter than disk. August. *l.* sub-amplexicaul, broad-lanceolate, sub-serrate, smooth. Stem glabrous. *h.* 3ft. North America, 1790.

The annuals (*Callistephus chinensis*), usually known as French, German, or China Asters, are very extensively grown, both for beds and pots, and their diversity and generally compact growth render them almost universal favourites. They require a rich loamy soil, and as the roots are produced near the surface, a mulching of rotten dung will be found most beneficial. Seeds may be raised in a cold frame in March or April, and, when the seedlings are large enough, they must be transplanted into beds from 9in. to 12in. apart each way. If it is desired to have them in pots, they may be removed thence with a good ball of earth adhering just before they commence flowering, liberally watered, and kept lightly shaded from the sun, until root action is resumed. Those kinds required for exhibition purposes should have several of the side shoots removed, so that the whole growing energy of the plant may be centralised into from five to seven flower-heads, by which means fine blossoms may be obtained. The dwarf kinds are most valuable for bedding and pots, as the taller kinds frequently require stakes for support. The following are the most important sections:

Betteridge's Prize. Very beautifully formed and brilliantly coloured varieties, unsurpassed for exhibition purposes. As this class has rather a straggling habit of growth, it is less suitable for bedding and borders than many of the others.

Boltze's Miniature Bouquet Pyramidal. Dwarf and elegant, in compact bouquets of six or eight; the truss of flower-heads springs directly from the ground, having only a few leaves at base. Colours very varied. *h.* 6in. to 8in.

FIG. 183. TRUFFAUT'S PÆONY-FLOWERED ASTER.

FIG. 184. TRUFFAUT'S PERFECTION ASTER.

Crown.* Distinct. The central portion, or disk, of the head of flowers is pure white, surrounded by a broad margin of coloured ray florets, such as purple, violet, crimson, rose, &c. Flower-heads large, flat, freely produced. *h.* 1ft. to 1½ft.

Dwarf Chrysanthemum-flowered.* In size of flower-heads and habit of growth, this surpasses all other dwarf varieties. The flowers are full, Chrysanthemum-shaped, produced in clusters, or bouquets, from ten to twenty in a truss, very delicate and beautiful in colour. *h.* 1ft.

Dwarf Pyramidal or **Dwarf Bouquet.** A pretty little class, and extremely floriferous, each plant producing from twenty to fifty heads of blossom. Some of the colours are: Exquisite carmine with white points, white with blue or carmine points, white with salmon centre, &c. *h.* 1ft.

Improved Imbricate. The best strain of pyramidal Asters with recurved florets; fine regular form of flowers, double to the centre, producing but few seeds. Colours very brilliant. *h.* 2ft.

Improved Rose. A handsome class, producing a branched head, displaying no less than fifty large double flower-heads, the outer

Aster—*continued.*

florets finely imbricated, and filled up to the centre when quite open. The colours are of great brilliancy, and of many shades. *h.* 2ft.

Pompone Goliath.* Flower-heads globular, and florets very closely set. Valuable for bouquets, as the flowers remain intact for a considerable time.

Pyramidal Hedgehog. Singular and unique. Stems upright, and branched; each branch terminated by a single flower-head, which is filled up with quill-like florets. Colours various. *h.* 1½ft.

Truffaut's Pæony Perfection.* Vigorous upright growers, having large, hemispherical-formed heads of flowers with incurved florets, 4in. across. The colours also are very varied. *h.* about 2ft. See Figs. 183 and 184.

FIG. 185. VICTORIA ASTER.

Victoria.* One of the most popular classes of Asters grown; flower-heads very double, imbricate, globular, 4in. in diameter, from ten to twenty on a plant, of various shades. *h.* 1ft., with a pyramidal habit. See Fig. 185.

ASTERACANTHA (from *aster*, a star, and *acantha*, a spine; referring to the disposition of the spines). ORD. *Acanthaceæ*. A handsome greenhouse herbaceous perennial, of easy culture in sandy loam. It should be grown in a sunny position, and be kept moderately dry, otherwise little but foliaceous growth will be produced; but, if thus treated, it flowers freely. Propagated by divisions in spring; or by seeds, sown in August.

A. longifolia (long-leaved). *fl.* yellow, in dense axillary fascicles. July. *l.* lanceolate, tapering to the base, narrow, sessile, serrately ciliated. Stem quadrangular. Plant rather hairy. *h.* 2ft. India, 1781.

ASTERACEÆ. *See* **Compositæ.**

ASTEROCEPHALUS. *See* **Scabiosa.**

ASTILBE (from *a*, without, and *stilbe*, brilliancy; in allusion to the inconspicuous flowers of some of the species). ORD. *Saxifrageæ*. Tall branching herbs, with triternate or biternate leaves, allied to *Spiræa*, from which they differ in having not more than three carpels, eight or ten stamens, and numerous albuminous seeds. They are all more or less graceful, and some indispensable, either when grown in isolated clumps, or intermingled with other herbaceous plants. They thrive well in almost any rich garden soil, preferring damp positions, and are easily propagated by division, which is best done in early spring. *A. japonica* is grown very extensively for decorative purposes, its elegant spikes of pure white flowers rendering it especially

Astilbe—*continued.*

valuable. The majority of the plants cultivated are imported, but they may be grown fairly well in this country in heavily manured soil. They should be potted as early as possible in the autumn, and plunged in ashes or fibre outside, when they will soon commence to root, after which they may be placed in heat, and forced as required, always giving an abundance of water. Indeed, the pots may be stood in pans of water, especially when the plants are well furnished with growth.

A. barbata (bearded). A synonym of *A. japonica*.

A. decandra (ten-stamened). *fl.* white, in spicate racemose panicles. May. *l.* biternate; leaflets cordate, deeply lobed and serrated, glandular beneath, and on the petioles. *h.* 2ft. to 3ft. North America, 1812.

FIG. 186. ASTILBE JAPONICA.

A. japonica (Japanese).* *fl.* small, pure white, in large branching racemose panicles. May. *l.* triternate or pinnate, serrated. *h.* 1ft. to 2ft. Japan. This is best grown in pots, as early frosts generally cut it down in the open air. SYNS. *Spiræa barbata* and *japonica*, also *Hoteia* and *A. barbata*. See Fig. 186.

A. j. variegata (variegated).* *l.* prettily variegated with yellow; panicles much more dense than the type; indeed, it is far superior in that respect.

FIG. 187. ASTILBE RIVULARIS.

A. rivularis (brook).* *fl.* yellowish-white, or reddish, in large panicled spikes. Late summer. *l.* biternate; leaflets ovate, doubly serrated, villous beneath and on the petioles. *h.* 5ft. Nepaul. A grand plant for the margins of lakes or damp woodlands. See Fig. 187.

A. rubra (red).* *fl.* rose, very numerous, in dense panicles. Late summer and autumn. *l.* biternate; leaflets oblique, cordate, 1in. to 2in. long, with elongated, serrated points. *h.* 4ft. to 6ft. India, 1851. A very pretty, but rare species; excellent for subtropical gardening.

Astilbe—*continued.*

A. Thunbergi (Thunberg's).* *fl.* small, white, very numerous, in erect, much branched, pyramidal panicles, with reddish and slightly downy stalks. May. *l.* unequally pinnate or bipinnate; leaflets broad, yellowish green, sharply toothed. *h.* 1½ft. Japan, 1878. This pretty little sub-shrub is extensively propagated on the Continent for forcing purposes.

ASTRAGALUS (a name applied to a shrub by Greek writers). Milk Vetch. Including *Phaca.* ORD. *Leguminosæ.* A very large genus of hardy herbs or sub-shrubs. Flowers in axillary clusters; standard larger than the wings. Leaves unequally pinnate. About one hundred species have been introduced in English gardens; many of these are lost to cultivation; the comparative few here described are still generally grown, and are good representative species. They are all of easy culture. The shrubby kinds grow well in any light dry soil, and are slowly increased by cuttings placed in a cold frame, or by seeds. The herbaceous perennials prefer a dry light soil, and may be increased by divisions or seeds; the latter mode is preferable, as many species are very liable to die if transplanted or divided, which is at best but a slow method. Seed should be sown in pots of sandy soil placed in a cold frame as soon as ripe, or very early in the spring, as they may lie a long time before germinating. The dwarfer species constitute admirable rockwork plants, and can be grown in pots containing a mixture of loam, peat, and sand. Seeds of the two annual species, *A. Cicer* and *A. Glaux*, merely require to be sown in the open border early in spring.

A. adsurgens (adsurgent).* *fl.* bluish purple; spikes oblong, pedunculate, longer than the leaves, densely packed. June. *l.* with eleven to twelve pairs of ovate-lanceolate acute leaflets; stipules acuminated, length of leaves. Plant ascending, smoothish. Siberia, 1818. A very handsome and rare perennial species.

A. aduncus (hooked). *fl.* rose purple, in oblong spikes; peduncles rather shorter than the leaves. June and July. *l.* with numerous pairs of roundish-ovate, smooth leaflets, sometimes downy. *h.* 6in. to 9in. Caucasus, 1819. Perennial.

A. alopecuroides (foxtail-like).* *fl.* yellow, disposed in thick dense ovate-oblong spikes, on short axillary peduncles. June. *l.* with numerous ovate-lanceolate, pubescent leaflets; stipules ovate-lanceolate, acuminated. Plant erect. *h.* 2ft. to 5ft. Siberia, 1737. One of the finest perennial species grown.

A. alpinus (alpine). *fl.* bluish-purple, sometimes whitish, drooping, disposed in racemes of about ½in. long. Summer. *l.* imparipinnate, with eight to twelve pairs of ovate or oblong leaflets. Britain. A very desirable, hairy, prostrate perennial.

A. arenarius (sand-loving).* *fl.* blue; peduncles few-flowered, rather shorter than the leaves. June. *l.* with linear-obtuse leaflets; stipules connate, opposite the leaves. Plant diffuse, tomentose from white adpressed down. *h.* 6in. Denmark, 1800. Perennial.

A. austriacus (Austrian).* *fl.* few; upper petal, or vexillum, blue, the rest purple; racemes pedunculate, longer than the leaves. May. *l.*, leaflets glabrous, linear, truncately emarginate. Plant diffusely procumbent. South Europe, 1640. Perennial.

A. canadensis (Canadian). *fl.* yellow, disposed in spikes; peduncles about as long as the leaves. July. *l.* with ten to twelve pairs of elliptic-oblong, bluntish leaflets. Plant nearly erect, rather hairy. *h.* 2ft. to 3ft. North America, 1732. Perennial.

A. Cicer (Vetch-like). *fl.* pale yellow, disposed in spike-like heads; peduncles longer than the leaves. July. *l.* with ten to thirteen pairs of elliptic-oblong mucronate leaflets. Plant diffusely procumbent. Europe, 1570. Annual.

A. dahuricus (Dahurian). *fl.* purple, in dense racemes, which are longer than the leaves. July. *l.*, leaflets, seven to nine pairs, oblong, mucronate. Plant erect, pilose. *h.* 1ft. to 2ft. Dahuria to China, 1822. Perennial.

A. dasyglottis (thick-tongued).* *fl.* purple, blue, and white mixed, in capitate spikes; peduncles a little longer than the leaves. June. *l.*, leaflets elliptic-oblong, somewhat emarginate; stipules connate, opposite the leaves. *h.* 3in. to 4in. Plant diffuse. Siberia, 1818. A charming little alpine perennial.

A. falcatus (hooked). *fl.* greenish yellow, in spikes; peduncles rather longer than the leaves. June. *l.* with sixteen to twenty pairs of elliptic-oblong, acute leaflets. Plant erect, rather hairy. *h.* 1ft. to 2ft. Siberia (in wet, grassy places). Perennial. SYN. *A. virescens.*

A. galegiformis (Galega-like).* *fl.* pale yellow, pendulous, racemose; peduncles longer than the leaves. June. *l.* with twelve or thirteen pairs of elliptic-oblong leaflets. Plant erect, glabrous. *h.* 3ft. to 5ft. Siberia, 1729. A showy perennial species.

A. Glaux (Milkwort). *fl.* purplish, in dense heads; peduncles longer than the leaves. June. *l.* with eight to thirteen pairs of small, oblong, acutish leaflets. Spain, 1596. Procumbent annual, clothed with whitish hair.

Astragalus—*continued.*

A. glycyphyllos (sweet-leaved).* *fl.* sulphur coloured, in ovate-oblong spikes; peduncles shorter than the leaves. June. *l.* with four to seven pairs of oval, bluntish, smooth leaflets; stipules ovate-lanceolate, entire. *h.* 2ft. to 3ft. Britain. A perennial prostrate trailer.

A. hypoglottis (under-tongued).* *fl.* variegated with purplish, blue and white, disposed in roundish heads; peduncles longer than the leaves, ascending. June. *l.* with numerous little ovate, obtuse, dark green leaflets, somewhat emarginate; stipules connate, ovate. Stems prostrate, rather hairy. *h.* 3in. Britain, &c. Perennial trailer.

A. h. alba (white-flowered).* This resembles the type, except in the colour of the flowers.

A. leucophyllus (hoary-leaved).* *fl.* pale yellow, about ½in. long, in dense racemes; peduncles much longer than the leaves. July and August. *l.*, leaflets in numerous pairs, broadly-linear, covered with soft, silky pubescence. *h.* 2ft. to 3ft. North America. Perennial.

A. maximus (largest).* *fl.* yellow; spike sessile, cylindrical, nearly terminal. June. *l.* with ovate-lanceolate, pubescent leaflets; stipules oblong-lanceolate. *h.* 2ft. to 3ft. Armenia. A very handsome, erect, perennial species.

FIG. 188. ASTRAGALUS MONSPESSULANUS, showing Habit and Flower.

A. monspessulanus (Montpelier).* *fl.* usually purplish, spicate; peduncles longer than the leaves. June. *l.*, leaflets twenty-one to forty-one, ovate or lanceolate, outer ones rather the smallest. Leaves hoary, and plant almost stemless when growing in dry exposed situations; but in rich earth or moist places the leaves are almost glabrous, and the stem becomes elongated. South Europe, 1710. This species is much appreciated, and well deserves a place in all collections. Evergreen trailer. See Fig. 188.

A. narbonensis (Narbonne). *fl.* yellow, disposed in somewhat globose spikes, on short axillary peduncles. June. *l.* with oblong-linear leaflets; stipules lanceolate. *h.* 2ft. to 3ft. Narbonne and Madrid, 1789. An erect hairy perennial.

A. odoratus (sweet-scented). *fl.* pale yellow, sweet-scented, disposed in spikes; peduncles same length as leaves. June. *l.* with eleven to fourteen pairs of oblong acute leaflets; stipules connate. Plant erect, rather ascending. *h.* 6in. Levant, 1820. Perennial.

A. onobrychioides (Onobrychis-like).* *fl.* beautiful purple, in capitate spikes on long peduncles. July. *l.* with eight to ten pairs of elliptic leaflets; stipules connate, opposite the leaves. Plant rather diffuse, shrubby at the base, clothed with adpressed hairs. *h.* 9in. to 12in. Iberia, Persia, &c., 1819. A very handsome perennial species.

A. Onobrychis (Onobrychis). *fl.* purple; spikes oblong-ovate, pedunculate, longer than the leaves. June. *l.* with seven to sixteen pairs of oblong leaflets. *h.* 1½ft., or procumbent. Mountains Southern Europe, 1640. This is an elegant perennial, and ranks among the very best. The varieties, all white flowered, are: *alpinus, major, microphyllus* and *moldavicus*, but only the first-named is now in cultivation.

Astragalus—*continued.*

A. pannosus (woolly).* *fl.* rose-coloured, in compact globose heads, with peduncles shorter than the leaves. July. *l.* with four to nine pairs of ovate-lanceolate leaflets, thickly coated with long white woolly hairs. *h.* 6in. to 9in. Siberia. Perennial.

A. ponticus (Pontic). *fl.* yellow; spikes sessile, almost globose. July. *l.* oblong, smoothish; stipules lanceolate. Stem rather hairy. *h.* 2ft. Tauria, 1820. A very showy, erect, border perennial.

A. purpureus (purple). *fl.* purplish blue, disposed in capitate spikes; peduncles longer than the leaves. June. *l.*, leaflets obovate, bidentate at the apex; stipules connate, opposite the leaves. Plant diffuse, procumbent, rather hairy. *h.* 3in. to 6in. Provence, 1820. Perennial.

A. sulcatus (furrowed).* *fl.* pale violet, but with a white keel, tipped with brown; racemes pedunculate, longer than the leaves. July. *l.* with linear-lanceolate leaflets. Plant erect, glabrous; stem furrowed. *h.* 2ft. to 3ft. Siberia, 1783. Perennial.

A. Tragacantha (great goat's thorn).* Gum Tragacanth. *fl.* pale violet, two to five together, axillary, sessile. June. *l.* with eight or nine pairs of linear hispid leaflets; young stipules connate, clothed with silky hairs; adult ones glabrous; petioles permanent, at length becoming hardened spines. *h.* 1½ft. to 3ft. Levant, 1640. Evergreen shrub. Tragacanth, a partially soluble gum, was formerly supposed to be furnished by this plant. It is, however, now known that *A. Tragacantha* yields none. Several species from mountainous regions in Asia Minor, &c., furnish the gum.

A. vaginatus (sheathed-stipuled). *fl.* rosy-purple, with white-tipped wings; calyx rather inflated, covered with soft white and black hairs; spikes dense. Summer. *l.* impari-pinnate, with seven or eight pairs of elongated-oblong leaflets, both surfaces covered with short silvery hairs. *h.* 1ft. Siberia. Perennial.

A. vesicarius (bladdery). *fl.*, upper petal purple, the wings yellow, and the keel white, tipped with yellow; calyx clothed with black adpressed down and long white spreading hairs; peduncles longer than the leaves. July. *l.* with five to seven pairs of elliptic leaflets. Plant diffusely procumbent, hoary from adpressed silky down. *h.* 6in. to 9in. France, 1737. Perennial trailer.

A. vimineus (twiggy). *fl.*, upper petal purplish rose, much longer than the pure white wings; calyx clothed with black hairs; spikes somewhat capitate, pedunculate, longer than the leaves. June. *l.* with four to six pairs of lanceolate acute leaflets, beset with adpressed hairs. *h.* 6in. to 1ft. Siberia, 1816. A handsome perennial.

A. virescens (greenish). Synonymous with *A. falcata.*

A. vulpinus (fox).* *fl.* pale yellow; spikes nearly globose, on very short peduncles. June. *l.* with obovate, obtuse, emarginate, rather velvety leaflets. Plant erect; stem glabrous. *h.* 2ft. to 3ft. Caucasus, 1815. A handsome border perennial.

ASTRANTIA (from *astron*, a star, and *anti*, in composition signifying comparison; in reference to the appearance of the umbels of flowers). ORD. *Umbelliferæ.* Ornamental, hardy, herbaceous perennials, natives of Europe and Caucasus. Universal umbels irregular, of few rays, surrounded by variable involucre; partial umbels regular, and containing many flowers, surrounded by many-leaved involucels. Radical leaves petiolate, palmately lobed; cauline ones few, sessile. Roots blackish. These are suited for borders, banks, and woodlands, growing well in any ordinary garden soil, but preferring a damp position. Easily increased by root divisions in autumn or spring.

A. carniolica (Carniolan).* *fl.* white. May. *l.* of involucre twelve or thirteen, quite entire, white, with a green line running along the middle of each, tinged with red; radical ones palmate; lobes five to seven, oblong, acuminated, unequally serrated. *h.* 6in. to 12in. Carniola, 1812. A pretty species.

A. helleborifolia (Hellebore-leaved).* *fl.* (and involucre) pink, pedicellate. June. *l.* of involucre twelve or thirteen, ovate-lanceolate, exceeding the umbel a little, bristly; radical ones palmate; lobes three, ovate-lanceolate, unequally serrated. *h.* 1ft. to 2ft. Eastern Caucasus, 1804. SYN. *A. maxima.*

A. major (greater).* *fl.* pinkish, pedicellate. May. *l.* of involucre fifteen to twenty, linear-lanceolate, quite entire, hardly longer than the umbel; radical ones palmate; lobes five, ovate-lanceolate, acute, rather trifid, toothed. *h.* 1ft. to 2ft. Europe, 1596. Very distinct and ornamental.

A. maxima (greatest). Synonymous with *A. helleborifolia.*

ASTRAPÆA (from *astrape*, lightning; alluding to the brightness of the flowers). ORD. *Sterculiaceæ.* Elegant stove evergreen trees. Peduncles axillary, long, bearing on their apex an umbel of large sessile flowers, enclosed in a leafy involucre. Leaves alternate, stalked, cordate, three to five-lobed. They thrive well in a mixture of loam and peat, and require a plentiful supply of water; but the best results accrue if the bottom of the pot can be stood in a saucer or tub of water. Propagated by cuttings of young

Astrapæa—*continued.*

wood, made in April, placed in a compost of loam and peat, or sand, under a bell glass, in heat.

A. tiliæflora (Lime-tree flowered). *fl.* pink. *h.* 20ft. Isle of Bourbon, 1824.

A. viscosa (clammy). *fl.* pink. *h.* 20ft. Madagascar, 1823.

A. Wallichii (Wallich's).* *fl.* scarlet; umbels drooping. July. *l.* large, cordate, angularly lobed; stipulas leafy, ovate-acuminated; peduncles long, hairy. *h.* 30ft. Madagascar, 1820. This splendid species has often been described as being one of the finest plants ever introduced into this country; and, when in full flower, nothing can exceed it in beauty and grandeur.

ASTROCARYUM (from *astron*, a star, and *karyon*, a nut; referring to the disposition of the fruit). ORD. *Palmæ.* A genus of very ornamental stove Palms, allied to *Cocos*, having the trunk (when present), foliage, fruit-stalks, spathes, and sometimes the fruit, covered with spines. The flowers develop from the axils of the old decayed leaves. Drupes oval, one-seeded, orange or yellow, in some species fragrant. Leaves pinnate, with linear segments, dark green above, and often of a silvery white below. The species thrive in a compost of two-thirds rich loam and one-third vegetable mould; water may be given copiously. Propagation may be effected by seeds, which should be sown in spring in a hotbed; or by suckers, if they are to be obtained.

A. acaule (stemless). *l.* pinnate, 3ft. to 10ft. long, slender and spreading; pinnæ narrow, arranged in clusters, pendent. Spines very numerous, long, flat, black. *h.* 10ft. Brazil, 1820.

A. aculeatum (prickly). *h.* 40ft. Guiana, 1824.

A. argenteum (silvery).* *l.* arching, wedge-shaped, pinnate, distinctly plicate, bright green on the upper surface, the under surface, as well as the stalks, covered with a fine white scurf, which gives them a silvered appearance. Columbia, 1875. One of the best of silver palms.

A. filare (thready).* *l.* erect, narrowly cuneate, with two divergent lobes; petioles covered with white scurf, both on the upper and under surfaces. Distinct and elegant, with a comparatively small and slender growth. Columbia, 1875.

A. granatense (New Grenadan). *l.* pinnate, with oblong-acuminate segments; the rachis is spiny, like the petiole, both on the upper and lower surfaces; leafstalks brownish, armed with numerous scattered needle-shaped dark-coloured spines. Columbia, 1876.

A. mexicanum (Mexican). Mexico, 1864.

A. Muru-Muru (Murumuru). *l.* pinnate, 10ft. to 12ft. long; leaflets lanceolate, sub-falcate, dark green above, silvery white below. Stem 12ft. to 15ft. high, densely clothed with strong reflexed black spines, over 6in. long. *h.* 40ft. Brazil, 1825.

A. rostratum (beak-sheathed). *l.* irregularly pinnate, 3ft. to 8ft. long; pinnæ 12in. to 18in. long; terminal lobe much larger and bifid, dark green above, silvery white below; petioles broadly sheathing at the base, densely armed with black spines, sometimes 2in. long. Stem slender, densely clothed with long black spines. A slow grower, ultimately becoming 30ft. high. Brazil, 1854.

A. vulgare (common). *h.* 30ft. Brazil, 1825.

ASTROLOBIUM. *See* **Ornithopus.**

ASTROLOMA (from *astron*, a star, and *loma*, a fringe; in reference to the bearded limb of the corolla). ORD. *Epacrideæ.* Very handsome, little, diffuse, greenhouse, evergreen shrubs. Flowers solitary, axillary; corolla tubular, distended above the middle, and with five bundles of hairs in the inside, near its base. Leaves crowded, alternate, linear, or obovate-lanceolate and mucronate. They thrive best in an equal mixture of sand, loam, and peat, with thorough drainage. Propagated by young cuttings, which root readily in sandy soil, under a bell glass, in a cool house.

A. denticulatum (finely-toothed). *fl.* axillary, erect; corolla pale red, with a ventricose tube. May to July. *l.* scattered, lanceolate, ciliated, usually procumbent, but sometimes slightly erect. *h.* 1ft. New Holland, 1824.

A. humifusum (trailing). *fl.* scarlet, similar to the foregoing. May and June. *l.* lanceolate-linear, rather convex above, with ciliated edges. Shrub prostrate, much branched. *h.* 1ft. New Holland, 1807.

ASTROPHYTUM MYRIOSTIGMA. *See* **Echinocactus myriostigma.**

ASYSTASIA (meaning not clear). ORD. *Acanthaceæ.* Stove evergreen shrubs. Flowers disposed in axillary or

Asystasia—*continued.*

terminal clusters; corolla somewhat funnel-shaped, five-lobed; calyx five-lobed, regular. Branches slender. They require a compost of peat and loam, with a little sand, and, to induce a vigorous growth, a little dry cow-dung may be applied. Propagated by cuttings of young shoots, placed in sandy soil, under a bell glass, in April, with a brisk bottom heat.

A. chelonioides (Chelonia-like).* *fl.* in terminal racemes, reddish purple, the border white. *l.* opposite, ovate-acute. *h.* 3ft. to 4ft India, 1871. A pretty dwarf sub-shrub.

A. coromandeliana (Coromandel). *fl.* deep lilac; racemes axillary, elongated, secund, strict. July. *l.* opposite, cordate-ovate; branches diffuse. *h.* 4ft. India, 1845. SYN. *Justicia gangetica.*

A. macrophylla (large-leaved).* *fl.* bilabiate, bell-shaped, rosy purple outside, and almost pure white within; spikes terminal, erect, 1ft. long. June. *l.* very large, obovate-lanceolate. *h.* 8ft. to 20ft. Fernando Po, 1867.

A. scandens (climbing).* *fl.* cream-coloured; tube of corolla widened and recurved above, lobes of limb crenately curved; racemes terminal, compact, thyrse-formed. July. *l.* obovate or ovate acute, glabrous. *h.* 6ft. Sierra Leone, 1845. This handsome stove climber requires a high, moist temperature after shifting. SYN. *Henfreya scandens.*

A. violacea (violet).* *fl.* violet purple, striped with white, in terminal racemes. *l.* shortly-stalked, ovate-acuminate, deep green, minutely hairy on both surfaces. *h.* 1ft. to 2ft. India, 1870. A pretty dwarf plant.

ATACCIA. A synonym of **Tacca** (which *see*).

ATALANTA (of Nuttall). A synonym of **Peritoma** (which *see*).

ATALANTIA (mythological: Atalanta, the daughter of Schœneus). ORD. *Rutaceæ.* A genus of ornamental stove evergreen shrubs, having the eight stamens united below into a tube, and with undivided leaves. It comprises about ten species. They thrive well in a mixture of loam and peat. Propagated by means of ripened cuttings, which root readily if inserted in sand under a hand glass, in heat.

A. monophylla (one-leaved). *fl.* small, white, in axillary racemes. *fr.* golden yellow, about the size of a nutmeg. June. *l.* simple, ovate-oblong, emarginate at the apex. Spines small, simple. *h.* 8ft. India, 1777. A thorny shrub.

ATAMASCO LILY. *See* **Zephyranthes Atamasco**

ATHAMANTA (named from Mount Athamas, in Sicily, where some species are found). ORD. *Umbelliferæ.* A genus of greenhouse or hardy herbaceous plants, usually velvety from villi on the stem, leaves, and fruit. Flowers white; involucra of one or few leaves; involucel of many leaves. *A. Matthioli* is a very graceful perennial, with Fennel-like foliage. It thrives well in any ordinary soil. Increased by divisions, or by seeds sown in spring.

A. Matthioli (Matthioli's). *fl.* white, twelve to twenty-five to an umbel. Summer. *l.* three or four, ternate; leaflets linear-filiform, elongated, divaricate. *h.* 1ft. to 2ft. Alps of Carinthia, 1802.

ATHANASIA (from *a*, not, and *thanatos*, death; alluding to the length of time which the flowers last). ORD. *Compositæ.* Rather ornamental greenhouse evergreen shrubs with yellow flowers, from the Cape of Good Hope. They grow well in a soil consisting of three parts loam and one part peat. Propagation is effected by cuttings, taken from half-ripened wood in spring, and inserted in sand, under a hand glass.

A. capitata (headed).* *fl.-heads* yellow. March. *l.* pinnatipartite; younger ones hoary, older ones smooth. *h.* 1½ft. Cape of Good Hope, 1774.

A. pubescens (downy). *fl.-heads* yellow. July. *l.* oblong, entire (or tridentate), softly hairy on both sides; when old, sub-glabrous. *h.* 6ft. Cape of Good Hope, 1768.

ATHEROSPERMA (from *ather*, an awn, and *sperma*, seed; seeds awned). ORD. *Monimiaceæ.* A beautiful greenhouse evergreen tree, with the aspect of a stately Conifer. Flowers panicled, dicœcious; perianth five to eight-cleft. Leaves opposite, aromatic. A compost of loam and peat, in about equal proportions, is necessary. It can be readily propagated by cuttings.

A. Moschata (Musk-scented). Plume Nutmeg; Tasmanian Sassafras. *fl.* white. June. *h.* 40ft. New Holland, 1824.

ATHEROSPERMEÆ. *See* **Monimiaceæ.**

ATHERURUS. *See* **Pinellia.**

ATHRIXIA (from *a*, not, and *thrix*, a hair; the receptacle being destitute of hairs). ORD. *Compositæ.* A greenhouse evergreen shrub. It succeeds best in turfy loam, peat, and sand, and requires to be potted firmly. Propagated by cuttings of young wood, inserted under a bell glass in sandy soil, and treated like **Erica** (which *see*).

A. capensis (Cape).* *fl.-heads* bright crimson, solitary, terminal. April. *l.* narrow, lanceolate, alternate, entire. *h.* 3ft. Cape of Good Hope, 1821.

ATHROTAXIS (from *athros*, crowded together, and *taxis*, arrangement; in reference to the disposition of the scales of the cones). ORD. *Coniferæ.* A small genus of Tasmanian evergreen dicœcious trees or shrubs, with small scale-like leaves, and small globular cones of many imbricated scales, with from three to six carpels under each scale. In very sheltered situations they will probably prove hardy; but, otherwise, they are only suitable for botanical collections. Increased by cuttings. This genus is almost universally misspelt *Arthrotaxis.*

A. cupressoides (Cypress-like). *l.* small, thick, leathery, spirally arranged, closely imbricated, deep glossy green. *h.* 30ft. A small, erect, and very slow growing tree, with numerous slender branchlets.

A. Doniana (Don's). A synonym of *A. laxifolia.*

A. imbricata (imbricated). A garden synonym of *A. selaginoides.*

A. laxifolia (loose-leaved). Differing from *A. cupressoides* in having longer, more pointed, open, and spreading leaves, which stand out from the stem in a Juniper-like fashion. Its lateral growths are rather pendulous. *h.* 20ft. to 25ft. SYN. *A. Doniana.*

A. selaginoides (Selago-like). *l.* glossy green, scale-like, spirally disposed, closely appressed to the shoots, branches and their ramifications very numerous. *h.* variable, up to 40ft. Very interesting, and quite distinct. SYN. *A. imbricata* (of gardens).

ATHYRIUM. *See* **Asplenium.**

ATRAGENE (a name originally given to *Clematis Vitalba* by Theophrastus). ORD. *Ranunculaceæ.* A genus of ornamental, hardy, climbing, deciduous shrubs, closely allied to *Clematis*, from which they differ in having numerous petals. They are increased by cuttings, which should be pricked in light sandy soil and placed under a hand glass; also by layering in the autumn. Both methods are slow; the layers should not be separated for about a year, when they will be vigorous plants. Seeds must be sown in early spring, in gentle heat; when the seedlings are large enough to handle, they should be pricked off and grown on in pots till they are strong plants.

FIG. 189. ATRAGENE ALPINA, showing Habit, Twining Leafstalk, and Flower.

A. alpina (alpine).* *fl.* blue, varying to white; petals ten to twelve, linear at the base, but dilated at the apex; peduncles one-flowered, longer than the leaves. May. *l.* biternate; leaflets ovate-lanceolate, acuminated, serrate. Mountainous parts of Europe, 1792. The white-flowered variety, named *alba*, is in cultivation. SYNS. *A. austriaca* and *A. sibirica.* See Fig. 189.

A. americana (American).* *fl.* large, purplish-blue; petals acute; peduncles one-flowered. May. *l.* whorled, in fours;

Atragene—*continued.*

leaflets stalked, cordate, lanceolate, acuminated, entire or somewhat lobed, or serrated. North America, 1797. SYN. *Clematis verticillaris.*

A. austriaca (Austrian). Synonymous with *A alpina.*

A. macropetala (large-petaled).* *fl.* blue. Manchuria, 1870.

A. sibirica (Siberian). Synonymous with *A. alpina.*

ATRIPLEX (from *a*, not, and *traphein*, to nourish) ORD. *Chenopodiaceæ.* A genus of, for the most part, uninteresting weeds, of very variable form and habit, and having the calyx, which incloses the fruit, enlarging after flowering. For culture, *see* **Orach.**

A. hortensis (garden). Orach; Sea Purslane. An annual species from Tartary, of no value as an ornamental plant, but considered a very desirable substitute for Spinach. The leaves must be gathered for use when young. The variety *A. h. atro-sanguinea* is a very pretty form, having handsome crimson leaves, and growing to a height of about 4ft. It is well worth growing with such plants as *Amarantus*, &c.

ATROPA (name of mythological origin). Belladonna; Dwale. ORD. *Solanaceæ.* A small genus, having a campanulate regular corolla, and a leafy persistent calyx. The berries of this native herbaceous perennial are exceedingly poisonous. The plant is of no horticultural value.

FIG. 190. FLOWER OF ATROPA BELLADONNA.

A. Belladonna. *fl.* green and purple, solitary, pedunculate, drooping. Summer. Berries about the size of a small cherry. *l.* ovate, acuminate, 4in. to 8in. long. *h.* 2ft. to 4ft. Britain. See Fig. 190.

ATTALEA (from *attalus*, magnificent; referring to the beauty of the genus). ORD. *Palmæ.* A genus of handsome stove Palms, distinguished from other genera in having the pinnæ arranged vertically, and not horizontally. The leaves spring up almost perpendicularly at the base, but in the upper part arch over. The pinnæ stand at right angles to the rachis—which is very narrow in proportion to its thickness—and while those of the lower side of the arch hang straight down, those of the upper side point straight up. They thrive well in a mixture of peat and loam in equal quantities, and enjoy a copious supply of water. Summer temperature, 65deg. to 80deg.; winter, 55deg. to 60deg. All the species are robust trees; but, although several have been introduced, few appear to be generally grown.

A. amygdalina (Almond-fruited).* *l.* pinnate, 3ft. to 6ft. long; pinnæ 12in. to 18in. long, and about 1in. broad; terminal lobe broad and bifid, rich dark green. Stem slender. New Grenada. One of the best. SYN. *A. nucifera.*

A. Cohune (Cohune).* *l.* erect, ultimately spreading, pinnate, furnished with from three to four dozen dark green pinnæ, sometimes 18in. in length; petioles rounded, and dark brown below, flat and green upon the upper side. Plant unarmed. *h.* 50ft. or more in its native habitat. Honduras.

A. compta (decked). *h.* 22ft. Brazil, 1820.

A. excelsa (tall).* *h.* 70ft. Brazil, 1826.

A. funifera (rope-bearing). The Piassaba Palm. *l.* vivid deep green, very ornamental, and of economic value in Brazil. 1824. The sheathing bases of the leafstalks separate into a coarse black fringe, which is collected and exported to Europe, being used in the manufacture of brooms, brushes, &c.

A. nucifera (nut-bearing). A synonym of *A. amygdalina.*

A. speciosa (showy).* *h.* 70ft. Brazil, 1825.

A. spectabilis (remarkable). *h.* 70ft. Brazil, 1824.

ATTENUATED. Tapering gradually to a point.

AUBERGINE, or **EGG PLANT** (*Solanum melongena*, variety *ovigerum*). These plants, besides being useful for culinary purposes, are very ornamental, and present an attractive appearance on walls or trellises, or in the flower garden; and, as they do well in any ordinary rich garden soil, if the position is warm, they give a good variation to the general run of plants used for decorative

Aubergine—*continued.*

effects. The Black-fruited kind is particularly suited for this purpose. Sow the seeds in a gentle heat, in the middle of April. As soon as the seedlings are large enough to handle, prick off into 4in. pots, replacing in heat till they root out freely. Gradually harden off by June, and then transfer to the positions where they are to grow. Let the plants be at least 2ft. apart, and place a strong stick to each one to support the fruit when it comes. For trellises, select the more moderate-sized varieties. In hot, dry

FIG. 191. FRUITING BRANCH OF ROUND AUBERGINE.

weather, the application of liberal supplies of liquid manure tends to increase the size of the fruit, and also to make the foliage more vigorous and handsome. Where very large fruit are needed for show or other purposes, it is well to remove all but the best one on the plant, and, by careful feeding with liquid manure, specimens of from 10lb. to 12lb. weight can be had. The foliage should not be pinched, as

FIG. 192. FRUITING BRANCH OF LONG AUBERGINE.

this would prevent the free swelling of the fruit. Aubergines are not so much grown in England for culinary purposes as in France and Italy, where they are largely used in stews and soups. The following are the most desirable varieties: New York Purple, the largest kind grown, and although not as ornamental as the next, is quite as useful; Black-fruited, large black fruit, with blackish violet leaves; and White-fruited, the sort most generally cultivated. See Figs. 191 and 192.

AUBRIETIA (named after M. Aubriet, a famous French botanical draughtsman). ORD. *Cruciferæ*. A small genus of hardy evergreen trailers. Racemes opposite the leaves, and terminal, lax, few-flowered. Leaves ovate or oblong, entire or angularly toothed, hairy. They make excellent rock plants, and will thrive in a deep rich loam anywhere, excepting under the shelter of trees. Cuttings struck, or seeds sown, during April or May generally make fine, dense, cushion-like growths, if transplanted on to a somewhat cool or shaded border, and carefully lifted in the autumn; the cuttings are best "drawn," or grown until they are soft, in a frame before they are removed. Where a stock of old plants exist, layer the long slender branches any time after flowering, and cover with a mixture of sand and leaf soil; they will then root freely and establish themselves in time for spring blossoming, for which purpose, when grown *en masse*, they are most useful. After flowering, they may be divided and transplanted.

FIG. 193. AUBRIETIA DELTOIDEA.

A. deltoidea (deltoid).* *fl.* purple; petals twice the length of the calyx; pedicels short, filiform; racemes opposite the leaves and terminal, lax, few-flowered. Early spring. *l.* with one or two large teeth on each side (therefore they are rhomboidal, not truly deltoid), scabrous, with short branchy stellate hairs. *h.* 2in. to 4in. Naples, &c., 1710. There are several garden varieties, the best of which are described below; most of them are regarded as distinct species. See Fig. 193. (S. F. G. 628.)

FIG. 194. AUBRIETIA PURPUREA.

A. d. Bouganvillei (Bouganville's).* *fl.* light violet purple, with very even imbricated petals. Habit very dwarf and compact, with short peduncles. A pretty form.

A. d. Campbelli (Campbell's).* Larger deep violet blue flowers, and of far more vigorous constitution than the typical form. *Grandiflora* comes very near this. SYN. *A. Hendersonii*.

Aubrietia—*continued.*

A. d. Eyrei (Eyre's).* A very fine variety, with a free branching habit, and large flowers of a rich violet-purple colour, rather longer than broad. *A. olympica* is very near, if not identical with this.

A. d. græca (Grecian).* *fl.* light purple. *h.* 4in. Greece, 1872. One of the best and largest flowered forms; very vigorous grower, with neat compact habit. A variety of this, named *superba*, has rather deeper-coloured flowers, produced over a very extended period. (R. G. 697.)

A. d. purpurea (purple).* Larger flowers and more erect habit than the type. *l.* broader, with two to five teeth. Stems more leafy. There is a variegated form, which is very pleasing and effective, useful for carpeting or edging small beds. See Fig. 194.

A. d. violacea (violet).* This is a hybrid form, even finer than *Campbelli*, with large deep violet-purple flowers, fading to reddish-violet, and is more effective than any of the others.

A. Hendersonii (Henderson's). A synonym of *A. d. Campbelli*.

AUCUBA (the Japanese name of the shrub). ORD. *Cornaceæ*. A genus of hardy evergreen shrubs, thriving better than any other in the smoky atmosphere of dense cities. They grow in ordinary well-drained garden soil, and require no special culture. If grown in pots, they should be planted firmly in rather sandy yellow loam, with plenty of drainage. They should not be allowed too large pots, or an unfruitful growth is likely to result. During the growing season, an abundance of water is needed, which must be lessened when the plants are fully developed. If cultivated in the greenhouse or conservatory, they should be plunged out of doors during summer. To insure a good supply of the very ornamental berries, which are produced on the female plant, careful fertilising is necessary. The time for applying the pollen is when the pistil exudes a slightly gummy substance, and otherwise shows signs of maturity. When it happens, as is sometimes the case, that the male flowers are open and the pollen mature before the female flowers are ready, the pollen should be collected on a dry camel-hair pencil, transferred to a piece of glass, and covered over by another piece, both of which must also be dry. It may be applied afterwards when wanted, as it retains its power for some weeks. Propagated by cuttings, inserted in any light sandy soil, with or without a covering, in spring or autumn; or readily increased from seeds, sown as soon as ripe.

A. himalaica (Himalayan).* *l.* lanceolate, or lanceolate acuminate; branches of the panicle very pilose. Berries spherical, not oblong. Himalaya. (F. d. S. 12, 1271.)

A. japonica (Japanese).* *l.* opposite, petiolate, broad, ovate-lanceolate, acuminated, toothed, leathery, glabrous, shining, pale green, beautifully spotted with yellow, having the midrib rather prominent, the rest of the leaf reticulately veined. *h.* 6ft. to 10ft. Japan, 1783. The numerous varieties, both of the male and female forms, among which will be found many of great beauty, all differ, more or less, in the variegation of their leaves. They are in very general cultivation, and nearly every nurseryman has an assortment. Among the best of them are the following: *albo-variegata, aurea, bicolor, latimaculata, limbata, longifolia, macrophylla, ovata, pygmæa*, and *pygmæa sulphurea*.

AUDOUINIA (in honour of V. Audouin, a profound entomologist). ORD. *Bruniaceæ*. An ornamental greenhouse evergreen shrub, thriving in a mixture of peat and sandy loam. Propagated by cuttings of half-ripened wood, inserted in sand, under a bell glass, in gentle heat.

A. capitata (headed) *fl.* purple, crowded into oblong, spike-like, terminal heads. May. *l.* spirally inserted, a little keeled. Branches erect. *h.* 1ft. to 2ft. Cape of Good Hope, 1790.

AUGUSTA. A synonym of **Stifftia.**

AULACOSPERMUM. *See* **Pleurospermum.**

AULAX (from *aulax*, a furrow; the under surface of the leaves of the original species being furrowed). ORD. *Proteaceæ*. Greenhouse evergreen shrubs, from the Cape of Good Hope, thriving best in a compost of fibrous loam, leaf soil, and sharp sand, with thorough drainage. Ripened cuttings, taken off at a joint, and inserted in pots of sandy soil, will root readily under a hand glass, in a cool house.

A. pinifolia (Pine-leaved). *fl.* yellow, racemose. July. *l.* filiform, channelled. *h.* 2ft. 1780.

A. umbellata (umbelled). *fl.* yellow. June. *l.* flat, spathulate-linear. *h.* 2ft. 1774. (B. R. 12, 1015.)

AURANTIACEÆ. An order of trees or shrubs, including the Orange and Lemon trees. Flowers fragrant. Fruit fleshy, edible. Leaves alternate, articulated above the stem, filled with transparent oil cysts, giving them a dotted appearance. Well-known genera are *Citrus* and *Limonia*.

AURICULA (*Primula Auricula*). This favourite spring flower (see Fig. 195) was, at one time, almost universally cultivated, but has of late years fallen into much neglect; it is now, however, happily regaining enthusiastic admirers. Although its culture is not nearly so difficult as is generally understood, a few special items of treatment are nevertheless necessary to grow it successfully.

Frames for the reception of Auriculas should be prepared, with a good bottom drainage, and an inside staging, similar to the back stage of a lean-to greenhouse, arranged as near the glass as possible. If the frames are about 4ft. wide, they will be very convenient; 1ft. deep in the front, and about 3ft. at the back. This will allow for a good stage arrangement. Of course, it is not necessary to construct an expensive staging, as common boards can be laid upon pots of various heights, the same results being practically secured. These frames should face north from May to October, and south in winter, during which latter time it will be necessary to well cover the sides with straw or brake. When frosty, the lights must also be

FIG. 195. A VARIETY OF PRIMULA AURICULA.

mated; but, unless there is absolute fear of frost, the glass should not be covered, as the more light the plants receive the better. On all suitable occasions, both during summer and winter, air must be freely admitted, and a good look-out kept during showery weather; hence it may be necessary to tilt the lights with blocks rather than remove them entirely. The latter plan should be adopted whenever practicable, especially during early spring, and after they are well established in their fresh pots in summer. This will greatly assist to ripen the crown, and produce hard, stout foliage, which will endure the winter much better than if grown with less air. Many cultivators prefer small span or lean-to houses to frames; and it must be admitted that these are better, more convenient, and in every way more beneficial. Simple, inexpensive structures, no higher than is absolutely necessary for convenience, with top and side ventilation, will meet all requirements; and if a 2in. hot-water pipe is arranged next the eaves inside, it will be a decided advantage during very severe weather.

Soil. The best compost that can be prepared for Auriculas is as follows: Four parts good fibrous loam, one part well-rotted cow manure, one part good leaf soil, and one part coarse river or silver sand, with a little charcoal or pounded oyster-shells added. Carefully mix the whole together before using. The loam should be stored about twelve

Auricula—*continued.*

months previous to being used, and it should be selected from districts with a fine atmosphere; the turf should be cut about 3in. thick. Cow manure that has lain for a year or so, and been subjected to sharp frosts, is most suitable, as insect life, which it very probably contains, is thereby destroyed, and the whole materially sweetened.

Potting. This operation requires to be carefully done as soon after flowering as possible, unless it is desired to save seed, when it must be deferred until the seed is ripened. May and June are the best months for general potting, and whatever the size of the pots used, they should be carefully and thoroughly drained. After a good layer of pot-sherds, place some charcoal, leaf mould, or spent hops. Many good growers use the last very advantageously. For good flowering plants, 48-sized pots are used, many cultivators preferring glazed pots to the unglazed; but such are not absolutely necessary to ensure success. Before repotting, remove most of the old soil, and with a sharp knife cut off any bruised or cankered portion of roots; the stout tap-root may also be cut away if devoid of fresh rootlets. Do not pot very firmly. Remove the plants to their summer quarters, withholding water for a few days, and keep the frames close. About a week after potting, water may be advantageously given, the plants will then soon resume root-action, and air may be admitted afterwards on all suitable occasions. The collar or neck of the plant must be left well above the surface of the soil.

Watering is a point that requires careful attention, as neglect in this matter will result in failure. During the growing season, Auriculas require an abundance of water; in fact, they must never be allowed to get dry. In the winter, they must only be watered when they are really dry, especially during a severe season. Care must be taken to avoid watering the leaves, particularly in early spring, as this tends to spoil the effect of the charming farinose foliage. Above all, water must not be allowed to stand in the heart of the plant, as such will inevitably cause incipient decay. Hence it is necessary to keep a sharp look-out for drippings from the glass, and to maintain tightly-glazed frames. On all occasions, decaying leaves must be removed, and especially during winter.

Top-dressing. About the middle or end of February, when the plants commence new growth, the surface soil should be removed about an inch or so deep, and the pots re-filled with a rich compost made up of the following: Two parts of turfy loam, one of rotten cow or hen manure, and one of leaf soil; if a little Standen's Manure is added, the compost will be improved. After this top-dressing, the plants may be watered freely.

Propagation by Offsets. When top-dressing, any offsets with roots should be removed, and as soon after as possible the remaining ones should be taken off, as it is much more desirable to do so early than later on, when repotting; for, when making the first growth, they are the more likely to root better, and stand a greater chance of making good plants before the season is over. Fill well-drained 3in. pots with sandy soil, and arrange about four offsets round the sides; place under a bell glass, or in a close hand-light, watering very sparingly so as to prevent them damping off. They will soon establish themselves, after which air may be admitted, and the plants may ultimately be potted off singly. To induce choice varieties to make offsets, the top of the old plant should be removed and treated like the others, when, as a rule, several shoots will be produced, which in due time may be removed. By this means, a nice stock of the rarer kinds may be obtained; whereas, if such a course were not adopted, the rate of increase would be extremely slow.

Flowering. During the flowering period, watering, as already stated, must be carefully attended to, for if the plants are allowed to get dry, the flowers will quickly shrivel. They must also be kept well shaded from sunshine, which quickly destroys the delicate blossoms. As the trusses are developing, particular attention must be given

Auricula—*continued.*

to night protection. It is, perhaps, better to cover every night than to run the risk of exposing the unexpanded flowers to frost, as the effect is very prejudicial; in fact, if subject to frost, smooth even flowers may not be expected.

Seed Saving and Sowing. The only way to obtain new varieties is by seed; hence the value of careful seed-saving will be apparent. Severe discrimination must be exercised in the selection of parents, and the flowers must be very carefully crossed. The anthers should be removed from the pistillate parent, if possible, before expansion, so as to prevent any possibility of self-fertilisation; and, when the stigma is ready, the pollen must be conveyed by means of a small camel's-hair brush, care being taken not to mistake the brushes used in different classes. It has been observed in Auriculas that the issue from crossbred seed favours the pollen more than the pistillate parent; hence the necessity of selecting good pollen parents. It is best to confine hybridisation to separate classes—*i.e.*, cross a Self with a Self, and a Green-edged variety with another of the same class. The importance of selecting the best in each class scarcely needs suggestion, having regard to constitution as well as the quality of the flowers. The seed should be sown as soon as ripe, or early in March, in well-drained pots, filled with sandy soil, which must be well watered previous to sowing. When this operation is completed, the seed must be lightly covered with coarse sand, a sheet of glass placed over the pot, and the latter stood in the hand glass, where the offsets are rooted. Some of the seedlings will appear in a month, but the bulk from that sown when ripe will not be seen until the following spring; while others will germinate even during the ensuing summer. The late comers should be particularly cared for, as they frequently produce the best varieties. When the seedlings are large enough, they must be pricked off in pots of sandy soil; and, when well established, potted off singly into small thumb pots, and afterwards encouraged as judgment suggests. Some growers allow the seedlings to remain in the store pots till they flower, when the best are kept, and those not required disposed of.

Insect Pests. Green fly are often very troublesome, and should be exterminated as speedily as possible, by tobacco fumigation, or by dipping the plants in a solution of Gishurst's Compound, or carefully prepared Fir-tree Oil, all of which are effectual. Many authorities denounce fumigation, while others advocate it. The roots are also attacked by a mealy louse, named *Trama auriculæ*, which clusters about the roots and collar of the plants, sucking nutriment therefrom; and although, provided they do not attack the collar, they have no greatly prejudicial effect on the plant, yet it is desirable to exterminate them. The only effectual way of accomplishing this is to remove all soil, and thoroughly cleanse the roots and collar in a solution of soft soap, with a little Fir-tree Oil added. Of course, this is most easily managed when repotting; and, unless the plants are very badly infested, it would not be advisable to run the risk of root washing later in the year.

Classes. Auriculas are now arranged in five classes, four of which constitute what are known as "show or stage Auriculas," while the other is known by the name of "Alpines." Each class is characterised by special points of distinction, which, in the opinion of the strict "florists" school, it is of the utmost importance to observe; and as there is room for systematists in this, as well as in any other branch of floriculture, we will follow the arrangement usually adopted, and describe the distinguishing features of, and enumerate some of the best varieties in, each class, with their raisers' names attached:

Green-edged. Outer edge green, or but sparingly dusted with powder; next, a zone of colour known as the body colour, which varies, the darkest being most esteemed; both edges of this zone should be even, especially the inner one, but there are few flowers perfect in this respect. Next to the body-colour is the paste, which occupies the space between the inner circle of the

Auricula—*continued.*

latter and the throat, this should be pure and dense, with a distinctly circular outline at the throat; the throat and tube should be bright yellow. Of course, this ideal standard has not yet been reached, as there are supposed defects in all or some sections of the flowers at present known. *Leading Varieties*: ADMIRAL NAPIER (Campbell), ALDERMAN WISBEY (Headley), APOLLO (Beeston), CHAMPION (Page), COLONEL TAYLOR (Leigh), DUKE OF WELLINGTON (Dickson), FREEDOM (Booth), GENERAL NEILL (Traill), HIGHLAND BOY (Pollitt), IMPERATOR (Litton), LADY ANN WILBRAHAM (Oliver), LORD PALMERSTON (Campbell), LOVELY ANN (Oliver), LYCURGUS (Smith), PRINCE OF GREENS (Traill), PRINCE OF WALES (Ashton).

Grey-edged. Edge heavily dusted with powder, so as almost to hide the normal green colour; other points same as the Green-edged varieties. *Leading varieties:* ALEXANDER MEIKLEJOHN (Kay), CHAS. E. BROWN (Headley), COMPLETE (Sykes), CONQUEROR OF EUROPE (Waterhouse), DR. HORNER (Read), F. D. HORNER (Simonite), GENERAL BOLIVAR (Smith), GEORGE LEVICK (Walker), GEORGE LIGHTBODY (Headley), JOHN WATERSTON (Cunningham), LANCASHIRE HERO (Lancashire), RICHARD HEADLEY (Lightbody), ROBERT TRAILL (Lightbody).

White-edged. Edge so heavily dusted with farina as to completely hide the green and give it a white appearance; the powder frequently as dense as on the paste portion; other points like the first. *Leading varieties:* ACME (Read), ANNE SMITH (Smith), ARABELLA (Headley), BEAUTY (Traill), BRIGHT VENUS (Lee), CATHERINA (Summerscales), CONSERVATIVE (Douglas), COUNTESS OF WILTON (Cheetham), EARL GROSVENOR (Lee), FAVORITE (Taylor), FRANK SIMONITE (Simonite), GLORY (Taylor), JOHN SIMONITE (Walker), NE PLUS ULTRA (Smith), REGULAR (Ashworth), SMILING BEAUTY (Heap), SYLVIA (Douglas), TRUE BRITON (Hepworth).

Selfs. Tube bright yellow, and circular at the top; paste dense, pure, with an even edge; all the rest of the flower of one colour, without shades or edging; any colour holds good. *Leading varieties:* APOLLO (Hay), BLACKBIRD (Spalding), C. J. PERRY (Turner), DUKE OF ARGYLE (Campbell), FORMOSA (Smith), GARIBALDI (Pohlman), HELEN LANCASTER (Pohlman), LORD OF LORNE (Campbell), MAZINNA (Pohlman), METEOR FLAG (Lightbody), METROPOLITAN (Spalding), MRS. DOUGLAS (Simonite), MRS. STURROCK (Martin), OTHELLO (Netherwood), PIZARRO (Campbell), TOPSY (Kaye).

Alpines. Centre golden yellow, or white, and destitute of powder; body colour various; edge one-coloured, shading off paler towards the margin. These are much hardier than any of the other classes, and will do well outside in most places. *Leading varieties:* A. F. BARRON (Turner), BEATRICE (Turner), BLACK PRINCE (Turner), BRONZE QUEEN (Turner), COLONEL SCOTT (Turner), DIADEM (Gorton), DUCHESS OF CONNAUGHT (Turner), EVENING STAR (Turner), GEORGE LIGHTBODY (Turner), JOHN LEECH (Turner), MRS. BALL (Turner), MRS. DODWELL (Turner), MRS. LLEWELLYN (Turner), MRS. MEIKLEJOHN (Meiklejohn), MRS. THOMSON (Turner), QUEEN VICTORIA (Turner), RUBENS (Turner), SAILOR PRINCE (Turner), SELINA (Turner), SPANGLE (Turner), SYDNEY (Turner), TRIUMPHANT (Turner).

AURICULATE. Having ear-like appendages.

AUSTRIAN ROSE. *See* **Rosa lutea.**

AVENA (derivation obscure). The Oat. ORD. *Gramineæ*. A genus of grasses with loose panicles and compressed spikelets. Of agricultural importance only, with the following exception, which is an annual of easy culture in ordinary garden soil. Propagated by seeds, sown in spring or autumn.

A. sterilis (barren). The Animated Oat. *fl.* in drooping panicles of large spikelets. *h.* 1½ft. to 2ft. Barbary, 1640. An elegant plant.

AVENS. *See* **Geum.**

AVENUES. In forming an Avenue, the plan must neither be tortuous nor of a "tedious sameness," but a gradually winding line should, above all, be obtained, which must in no way interfere with the view from the house. About 12ft. is the width usually allowed for the road, but this depends upon individual taste or idea—this remark applies to planting in double rows, the trees forming a series of triangles, or in single rows. The distance across the road from one row of trees to those opposite should be at least 24ft. The Lime is extensively used for Avenues on account of its regular growth and the shade it affords. The Cedar of Lebanon is one of the best and most suitable evergreens. The Dutch Elm is used because of its rapid growth, and forms one of the best deciduous trees for this purpose. The well-known Horse Chestnut, in sheltered spots, is very ornamental, as is also the Spanish Chestnut; the latter spreads rapidly. Where immediate effect is required, nothing gives more satisfaction than the White Poplar; it grows in a wet soil better than anything else.

Avenues—*continued.*

Deodars, Araucarias, Douglas Pine, the Mexican, Chinese, and Japanese Cypresses, and many others, are eminently suited for Avenue planting. Shrubs and herbaceous plants should be introduced between the trees, and so remove any bareness that may occur. *Diervilla rosea*, and its variegated form, *Aucubas*, *Rhododendrons*, *Hypericums*, and many others, could be mentioned to serve this purpose. A moderately good soil will be found to answer generally.

AVERRHOA (in honour of Averrhoes, of Cordova, a celebrated Arabian physician, who resided in Spain during the domination of the Moors, about the middle of the twelfth century; he translated Aristotle into Arabic). ORD. *Geraniaceæ*. Ornamental stove trees, thriving in loam and peat. Half-ripened cuttings will strike in sand, under a hand glass, about April, with bottom heat. The leaves of the first-named species are irritable to the touch.

A. Bilimbi (Bilimbi-tree). *fl.* reddish purple, disposed in racemes, rising from the trunk. May. *fr.* oblong, somewhat resembling a small cucumber, with a thin, smooth, green rind, filled with a grateful acid juice, and the substance and seeds not unlike that of a cucumber. *l.* alternate, with from five to ten pairs of ovate-lanceolate, entire, smooth leaflets on short stalks. *h.* 8ft. to 15ft. Native country unknown, 1791. (B. F. S. 117.)

A. Carambola. Carambola-tree. *fl.* red, scattered, disposed in short racemes, usually rising from the smaller branches, but sometimes from the larger ones, and even the trunk. *fr.* the size of a hen's egg, acutely five-cornered, with a thin, yellow rind, and a clear watery pulp. *l.* alternate, with about four to five pairs of ovate, acuminated, entire, stalked leaflets, the outer ones largest. *h.* 14ft. to 20ft. 1793. This, as well as the first-named species, is cultivated throughout the hotter parts of India, but where it occurs truly wild is not known.

Averrhoa—*continued.*

AVOCADO PEAR. *See* **Persea gratissima.**

AWL-SHAPED. Narrow-pointed, resembling an awl.

AWLWORT. *See* **Subularia.**

AXIL. Literally the armpit; in plants applied to the angle formed by union of the leaf and stem.

FIG. 196. AZALEA BALSAMINÆFLORA.

AXILLARIA. *See* **Polygonatum.**

AXILLARY. Growing in the axil of anything.

AYRSHIRE ROSE. *See* **Rosa repens capreolata.**

AZALEA (from *azaleos*, dry, arid; in allusion to the habitat of the plant). ORD. *Ericaceæ*. A genus of very popular and beautiful hardy or greenhouse plants. The species enumerated were included under *Rhododendron* by Don, Loudon, and others, contrary to the classification of Linnæus, but the distinctive characters are not consistent. In this genus, the stamens are usually five, but in *Rhododendron* ten is the typical number.

Ghent or *American Azaleas.* These are extremely

Azalea—*continued.*

popular hardy deciduous shrubs. When plants are grown in the open, artificial crossing will be unnecessary; but this method must be employed upon those grown in the cool greenhouse, if well fertilised seeds are required. The seed should be gathered and sown when ripe in a large shallow frame containing from 2in. to 3in. of peat, over which more peat must be laid very level by means of a fine sieve; or they may be kept until early the following spring. No covering will be necessary, but a thorough watering with a fine-rosed water-pot must be given. The lights should be darkened, and the frames kept close until the young seedlings begin to appear, when they must have air (carefully admitted), shade, and a daily sprinkling of water. By the autumn, they will be large enough to transplant in small clumps into boxes of peat and coarse sand, and to place in other frames, or in the open. In each case, they will need watering, shading, and to be kept close until growth commences. The hardier the plants are before winter commences, the better; but a protection of mats or similar material will prevent the probability of their being killed by severe frosts. During the following season, they will only require water during dry weather, and no protection need be afforded this winter. The next spring, they should be planted out singly in beds, sufficiently wide apart to allow the development of two years' growth. If an upright growth is being made, the leading shoot must be shortened, in order to secure dwarf, well-branched plants. The same methods should be employed on a smaller scale where but a few are wanted. Grafting is largely practised to increase the stock of named varieties or choice seedlings, the stock employed being *A. pontica*. This process, of course, ensures the quicker production of flowering plants. Layering in March, encasing the part buried with moss, is also some times practised; but the layer must be left two years before separating. Cuttings of the last year's wood, 2in. or 3in. long, taken with a heel, root readily in sand; about the end of August is the best time for so doing. If they are pricked off in pots or pans of sandy soil, and kept in a cool frame until they are calloused, and afterwards introduced into a slight bottom heat, they root quicker, but this is not absolutely essential. When placed outside, they should be covered with a handlight for about two months, and, at the end of this time, air should be gradually given and increased. Ghent Azaleas are now forced extensively for the market as well as in private gardens; and, by judicious culture, they can be had in full blossom by Christmas. With this end in view, they should be grown in pots, and have the growth prematurely completed soon after flowering with the aid of a little artificial heat; after which they may be placed outside. During very hot and dry weather, the north side of a wall is necessary, to prevent their flowering in the autumn. The same plants must only be forced every alternate year. Commence to place the plants in heat in October, and keep up a succession until the following March. The best plants for forcing purposes are obtained from the Continent, where they are grown in enormous quantities. When grown permanently out of doors, the most suitable soil is peat and rough sand mixed. Failing this, leaf mould, maiden loam, and sand, will be found satisfactory. In many cases, we have known them to flourish in ordinary garden soil.

The following varieties of Ghent Azaleas are distinct, and all worth growing: ADMIRAL DE RUYTER, deep red-scarlet, very fine; ALTACLERENSIS, bright yellow; AMŒNA, light pink; CARNEA ELEGANS, pale pink, shaded sulphur; COCCINEA MAJOR, dark scarlet, very fine; CUPREA SPLENDENS, rich pink, shaded yellow; DECORATA, lovely pink; DIRECTEUR CHARLES BAUMANN, rich vermilion, spotted yellow; ELECTOR, rich orange-scarlet; GEANT DES BATAILLES, deep crimson, very fine; MADAME JOSEPH BAUMANN, bright pink, very free and good; MARIA VERSCHAFFELT, shaded pink and yellow; MIRABILIS, very lovely pink; MORTERI, rich yellow, shaded rosy-red; PONTICA MACRANTHA, rich deep sulphur, very large and fine; PRINCESSE D'ORANGE, salmon-pink, very fine; SANGUINEA, deep crimson; VISCOSA FLORIBUNDA, pure white, very fragrant.

Azalea—*continued.*

A. arborescens (tree-like).* *fl.* large, reddish, not clammy, leafy; tube of corolla longer than the segments; calyx leafy, with the segments oblong and acute. May. *l.*, of the flower buds large, yellowish-brown, surrounded with a fringed white border, obovate, rather obtuse, smooth on both surfaces, glaucous beneath, ciliated on the margins, and having the midrib almost smooth. *h.* 10ft. to 20ft. Pennsylvania, 1818. Deciduous species.

A. balsaminæflora (Balsam-flowered).* *fl.* bright salmony red, finely double and rosette-like, the segments regularly imbricated, much resembling in general appearance the blossoms of a Camellia-flowered Balsam. Japan. It is a distinct species, and remains in blossom for a considerable period; the flowers are invaluable for bouquets. See Fig. 196, for which we are indebted to Mr. Bull.

A. calendulacea (Marigold-like).* *fl.* yellow, red, orange, and copper coloured, large, not clammy, rather naked; tube of corolla hairy, shorter than the segments. May. *l.* oblong, pubescent on both surfaces, at length hairy. *h.* 2ft. to 6ft. Pennsylvania to Carolina, 1806. This is said to be the handsomest shrub in North America. There are several varieties of it in cultivation. Hardy; deciduous. (B. M. 1721, 2143.)

A. hispida (bristly). *fl.* white, with a red border and a tinge of red on the tube, which is wide and scarcely longer than the segments, very clammy, leafy; stamens ten. July. *l.* long-lanceolate, hispid above, and smooth beneath, glaucous on both surfaces, ciliated on the margins, and having the nerve bristly beneath. Branches straight, and very hispid. *h.* 10ft. to 15ft. New York, &c., 1734. A hardy deciduous species. (W. D. B. 1, 6.)

FIG. 197. FLOWER OF AZALEA LEDIFOLIA.

A. ledifolia (Ledum-leaved).* *fl.* pure white, showy; corolla campanulate; in threes at the extremities of the branches; calyx erect, glandular, and viscid. March. *l.* elliptic-lanceolate. *h.* 2ft. to 6ft. China, 1819. The whole shrub is very hairy. Hardy evergreen. SYN. *A. liliiflora.* See Fig. 197. (B. M. 2901.)

A. liliiflora (lily-flowered). Synonymous with *A. ledifolia.*

A. nudiflora (naked-flowered).* *fl.* in terminal clustered racemes, appearing before the leaves, rather naked, not clammy; tube of corolla longer than the segments; teeth of calyx short, rather rounded; stamens much exserted. June. *l.* lanceolate-oblong, nearly smooth and green on both surfaces, ciliated on the margins, having the midrib bristly beneath, and woolly above. *h.* 3ft. to 4ft. North America, 1734. This species hybridises very freely with *A. calendulacea, A. pontica, A. viscosa,* &c., and descriptive lists of a host of hybrids of almost every conceivable shade, both double and single, are to be found in continental and home catalogues, to which the reader is referred. Hardy. (W. F. A., t. 36.)

A. pontica (Pontic).* *fl.* leafy, clammy; corolla funnel-shaped; stamens very long. May. *l.* shining, ovate, oblong, pilose, ciliated. *h.* 4ft. to 6ft. Levant, Caucasus, &c., 1793. The varieties of this species are also numerous, differing principally in the colour of the flowers and the hue of the leaves. The flowers are of all shades, and frequently striped. The name generally adopted, as above, must not be confounded with *Rhododendron ponticum.* If the genus *Azalea* is merged into *Rhododendron,* as is done by most systematists, this plant must be called by Don's name, *Rhododendron flavum.* (I. H. 1864, 415.)

A. procumbens (procumbent). *See* **Loiseleuria procumbens.**

A. speciosa (showy).* *fl.* scarlet and orange coloured; corolla silky, with obtuse, ciliated, lanceolate, undulated segments; calyx pubescent. May. *l.* lanceolate, ciliated, acute at both

Azalea—*continued.*

ends. Branches hairy. *h.* 3ft. to 4ft. North America. The varieties of above are several, varying in the shape of the leaves and the colour of the flowers. (L. B. C. 1255)

A. viscosa (clammy).* *fl.* white, sweet-scented, in terminal clusters, downy, clammy, leafy; tube of corolla as long as the segments. July. *l.* oblong-ovate, acute, smooth, and green on both surfaces, ciliated on the margins, having the midrib bristly. *h.* 2ft. to 4ft. North America, 1734. Like nearly all species belonging to this genus, the varieties are many, varying in the colour of the flowers and otherwise. (T. S. M. 438.)

A. v. nitida (shining).* *fl.* white, tinged with red, clammy, leafy; tube of corolla a little longer than the segments. April. *l.* oblanceolate, rather mucronate, leathery, smooth on both surfaces, shining above, having the nerve bristly beneath, with revolute, ciliated margins. *h.* 2ft. to 4ft. New York, 1812. Hardy; deciduous. (B. R. 5, 414.)

Indian or *Chinese Azaleas.* This is a section of greenhouse evergreen varieties obtained from *A. indica* (which *see*), blooming continuously from November to June, or even later, and of the greatest value for all purposes, whether for decoration, cutting, or exhibition. Cultivation: Thorough drainage is essential, and a compost of half peat, the other half made up of fibrous loam, leaf soil, and sand, in equal quantities. They cannot have too much light and air, and may be grown to almost any size by shifting from one pot to a size larger. In repotting, the whole of the crocks should be taken away from the base of the ball of soil and roots, and the top should also be removed till the fine roots are reached. The plant should then be put in the new pot, and the additional soil rammed firm, in order to prevent the water running through it, and thus depriving the plant of any benefit therefrom. In all cases, the roots near the stem must be above the soil, so that the water may not sink in next the stem, or death will most certainly ensue. After potting, for a few days the plants should be kept close and freely syringed, and as the growth is completed, they may be well hardened off. The best time for potting is after flowering, before the new growth has been made. From October to June the plants should be in the greenhouse, and during the other months in a cold frame, or plunged in pots in the open; or, what is preferable in favoured localities, planted out in prepared beds; they will thus be kept cleaner, and the growth will be much superior. In autumn they may be lifted and repotted, placing in a shady position for a few days. Water in abundance must be given throughout the blooming and growing season; and the plants must, on no account, be allowed to become dry. At the same time, a proper amount of care is most essential, as an excessive amount of moisture is equally as fatal as drought. Cuttings should be placed in sand under a bell glass with moderate bottom heat; half-ripened ones are preferable. They must be cut up to a joint—the base of a leaf—the lower leaves for an inch stripped off, and the stem stuck into the sand, which should lay, about an inch thick, on the top of sandy peat soil; the bottom of the cuttings should reach, but not go quite into, the soil. The whole should be covered with a bell glass, which must be wiped dry every morning. Soon after the cuttings have commenced growing, place them in small pots. They are also very largely and easily increased by grafting; indeed, this is the only satisfactory method of securing standards. Seeds may be sown similar to the last section, but in the greenhouse, and, when well up, pricked out into little pots 1in. apart. Azaleas are liable to the attacks of thrips and red spider, the latter being especially troublesome if the plants are in a dry position; frequent syringing will materially help to eradicate both pests. If insufficient, syringe with a solution of Gishurst's Compound.

A. amœna (pleasing). *fl.* almost campanulate, rich crimson, about 1¼in. across, hose-in-hose conformation, produced in great profusion. April. *l.* small, size of the common Box, hairy. *h.* 1ft. China. This is an elegant little neat and compact growing shrub, which has proved to be quite hardy in England. (B. M. 4728.) A very beautiful series of hybrids have been obtained by crossing this species with *A. indica*, which are most serviceable and

Azalea—*continued.*

free. The following are most desirable: LADY MUSGRAVE, light carmine; MISS BUIST, pure white; MRS. CARMICHAEL, rich magenta, shaded crimson; PRIME MINISTER, soft pink, deep shaded, very free; PRINCESS BEATRICE, light mauve, very distinct and free; PRINCESS MAUDE, rich magenta, rose shaded.

FIG. 198. FLOWER OF AZALEA INDICA.

A. indica (Indian).* *fl.* campanulate, terminal, solitary or twin; calycine teeth long-lanceolate, obtuse, ciliated, spreading. *l.* cuneate-lanceolate, finely crenulated, covered with sharp, close-pressed rigid hairs, attenuated at both ends. Branches also covered with sharp, close-pressed, rigid hairs. *h.* 3ft. to 6ft. China, 1808. See Fig. 198. There are a great number of garden seedlings of the Indian Azalea, including every shade and colour. A selection to any extent may be made from the nurserymen's catalogues, but, for the guidance of the amateur, we have made a rigid selection of the best double and single varieties.

Double-Flowered: A. BORSIG, pure white; ALICE, rich deep rose, blotched with vermilion, very fine; BERNARD ANDRE, dark violet-purple, large, semi-double; CHARLES LEIRENS, dark salmon, good form and substance; COMTESSE EUGENIE DE KERCHOVE, white, flaked with red-carmine, semi-double; DOMINIQUE VERVAENE, bright orange, very fine; DR. MOORE, deep rose, with white and violet shading, very fine; EMPEREUR DE BRÉSIL, rich rose, banded white, the upper petals marked red; FRANCIS DEVOS, deep crimson; IMBRICATA, pure white, sometimes flaked with rose; MADAME IRIS LEFEBVRE, dark orange, shaded with bright violet, and blotched with chocolate; PRESIDENT GHELLINCK DE WALLE, intense rose, upper petals blotched with lake, and crimson-rayed; SOUVENIR DE PRINCE ALBERT, rich rose peach, broadly margined with pure white, very free and beautiful.

Single-Flowered: CHARMER, rich amaranth, very large; COMTESSE DE BEAUFORT, rich rose, the upper petals blotched with crimson; CRITERION, rich salmon pink, white-margined; DUC DE NASSAU, rich rosy-purple, very free and large; ECLATANTE, deep crimson, rose shaded; FANNY IVERY, deep salmon-scarlet, blotched magenta, very fine; FLAMBEAU, rich glowing crimson, extremely showy; JOHN GOULD VEITCH, lilac-rose, netted and bordered white, and blotched with saffron, very showy; LA SUPERBE, rich lake, bordered orange, and black spotted, a very fine variety; LA VICTOIRE, centre reddish, white towards the edge, the upper petals spotted with maroon-crimson; LOUIS VON BADEN, pure white, a grand variety; MADAME CHARLES VAN ECKHAUTE, pure white, with beautifully crisped edges, of excellent form and substance; MADAME VAN HOUTTE, richly flaked with carmine and rose, very large and free; MARQUIS OF LORNE, brilliant scarlet, of the finest form and substance; MRS. TURNER, bright pink, white-margined, and spotted with crimson; PRESIDENT VAN DEN HECKE, white, striped and speckled with crimson, with a yellow centre; PRINCESS ALICE, pure white, one of the best; REINE DES PAYS-BAS, rich violet-pink, margined with white; ROI D'HOLLANDE, dark blood-red, spotted with black; SIGISMUND RUCKER, rich rose, white bordered, with crimson blotches; WILSON SAUNDERS, pure white, striped and blotched with vivid red, very fine.

A. mollis (soft). Synonymous with *A. sinensis.*

A. sinensis (Chinese). *fl.* campanulate, downy, flame coloured; stamens equal in length to the petals. May. *l.* slowly deciduous, elliptic, acutish, pilosely pubescent, feather-nerved, with ciliated margins, greyish beneath. *h.* 3ft. to 4ft. China and Japan. A large number of seedlings and hybrids from this species are in cultivation, known under the name of Japanese Azaleas, and all are valuable for the decoration of the cool conservatory, or for outdoor work. SYN. *A. mollis.* (L. B. C. 885.)

AZARA (in honour of J. N. Azara, a Spanish promoter of science, but of botany in particular). ORD. *Bixineæ.* Showy evergreen, hardy and half-hardy shrubs, with alternate, simple, stalked stipulate leaves, and fragrant flowers.

Azara—*continued.*

They thrive well in a compost of loam, leaf soil, and sand. Ripened cuttings root readily if placed in sand, under glass, in slight heat. It is believed that all the species enumerated will prove hardy if a slight winter protection in midland and northern counties be afforded. This precaution will be unnecessary in more southern parts.

A. dentata (toothed). *fl.* yellow; corymbs sessile, few-flowered. June. *l.* ovate, serrated, scabrous, tomentose beneath; stipules leafy, unequal in size. *h.* 12ft. Chili, 1830. (B. R. 1728.)

A. Gillesii (Gilles').* *fl.* bright yellow; panicles axillary, densely packed. Spring. *l.* large, Holly-like, ovate, coarsely toothed, smooth. *h.* 15ft. Chili, 1859. (B. M. 5178.)

BABIANA (from *babianer*, the Dutch for baboon; in reference to the bulbs being eaten by baboons). ORD. *Irideæ*. A genus of very ornamental bulbous plants confined to the Cape of Good Hope, with the exception of a single species, which is found in Socotra. Flowers occasionally fragrant, and generally characterised by their rich self-colours, or the striking contrast of very distinct hues in the same flower; perianth regular and symmetrical, with six ovate divisions (tube varying in length). Stems from 6in. to 9in. high, arising from a small bulb-like corm, and bearing tapering plaited leaves, which are usually more or less densely covered with long hairs; the scapes are racemose,

FIG. 199. AZARA MICROPHYLLA, showing Habit, and Foliage (half natural size).

A. integrifolia (entire-leaved).* *fl.* yellow, on numerous short axillary spikes, of an aromatic fragrance. Autumn. *l.* obovate or oblong, entire, smooth; stipules equal, permanent. *h.* 18ft. Chili (about Conception), 1832. The variegated-leaved form, although rare, is very ornamental. The variegation consists of greenish-yellow, with a blotch of dark green, and in a young state edged with deep pink.

A. microphylla (small-leaved).* *fl.* greenish, corymbose, succeeded by numerous small orange-coloured berries. Autumn. *l.* small, distichous, obovate, obtuse, dark-shining green. *h.* 12ft. Chiloe and Valdavia, 1873. This shrub is very ornamental as a standard, and also excellent for covering walls. Quite hardy. See Fig. 199, for which we are indebted to Messrs. Veitch and Sons.

each bearing about six or more simultaneously expanding flowers. They may be successfully grown in pots. By this plan there is, perhaps, less danger of loss, and their flowering season can be prolonged considerably. A light sandy compost, with a small proportion of well-decayed manure, is required, and thorough drainage is also most essential. Use 48 or 60-sized pots, placing four or five corms in the former, and two or three in the latter, and keep moderately dry until they commence to form roots. October is the best time to pot. As soon as the plants appear above ground, water may be carefully given, and the supply pro-

Babiana—*continued.*

portionately increased as the plants develop. Very weak liquid manure, applied twice a week, just as the spikes are pushing up, will be beneficial. When the flowers fade, and the stems show signs of decay, the supply of water must be gradually decreased, thus inducing the thorough maturation of the corms, upon which the next season's display depends. When quite down, store the pots in a dry place till the time for repotting arrives, when the corms should be carefully cleaned, and all offsets separated, the latter being potted up in the same way as the parent corms in order to produce flowering specimens; or they may be kept in a pot of sand and planted in a warm border outside in March. Outdoor culture: A sheltered, sunny, and well-drained situation is most essential to success. Although not absolutely necessary, it is preferable to replant every year in early spring, placing the bulbs about 5in. or

FIG. 200. BABIANA STRICTA RUBRO-CYANEA.

6in. deep, with a little sand sprinkled about them. Planting may, of course, be done in autumn, when it will be necessary to cover with cocoa nut fibre refuse to the depth of 5in. or 6in. In warm, sheltered situations, the corms may remain undisturbed; but, as a rule, it is desirable to remove them late in autumn, when the leaves are dead, and store them in dry sand through the winter in a cool, airy position, free of frost. Mixed Babianas may be purchased from dealers at a cheap rate, and, for general purposes, they are best to plant. Propagation may be effected by offsets and seeds. The former is the best and quickest method. The offsets should be grown in boxes or planted out in light rich soil until large enough for flowering. Seeds sown in pans, and placed in a gentle heat, will grow at almost any time; the young plants will require to be carefully transplanted each season until they develop into flowering corms.

B. cœrulescens (bluish). Synonymous with *B. plicata.*

B. disticha (two-ranked).* *fl.* with a Hyacinth-like fragrance; perianth pale blue; divisions narrow; margins undulated or crisped. June, July. *l.* lanceolate, acute. *h.* 6in. 1774. (B. M. 626.)

B. plicata (folded).* *fl.* with a very fragrant clove carnation-like perfume; perianth pale violet-blue; anthers blue, and stigmas yellow. May, June. *l.* lanceolate, distinctly plicate. *h.* 6in. 1774. SYNS. *B. cœrulescens, B. reflexa.* (B. M. 576.)

B. reflexa (reflexed). Synonymous with *B. plicata.*

B. ringens (gaping).* *fl.* scarlet, irregular in form, gaping, very handsome. May, June. *l.* narrow, acute, deep green. *h.* 6in. to 9in. 1752. (L. B. C. 1006.)

B. sambucina (Elder-scented). *fl.* bluish-purple, with an Elder-like fragrance; perianth divisions spreading. April, May. *l.* lanceolate, slightly plicate. *h.* 6in. to 9in. 1799. SYN. *Gladiolus sambucinus.* (B. M. 1019.)

B. stricta (strict).* *fl.*, perianth segments narrow, acute, outer three white, inner three lilac-blue, with a dark blotch near the base of each. May. *l.* broadly lanceolate, obtuse, ciliated. *h.* 1ft. 1795. (B. M. 621.)

B. s. angustifolia (narrow-leaved). *fl.* fragrant; perianth bright blue, slightly pink in the tube. May and June. *l.* linear, acute, light green. *h.* 1ft. 1757. (B. M. 637.)

B. s. rubro-cyanea (red-and-blue).* *fl.* 2in. or more in diameter; upper half of the perianth very brilliant blue, and the lower part rich crimson, forming a central zone, in striking contrast to the blue portion. May, June. *l.* broad, acuminated, downy on the under surface. *h.* 6in. to 8in. 1796. See Fig. 200. (B. M. 410.)

B. s. sulphurea (sulphur-coloured).* *fl.* cream-coloured or pale yellow; anthers blue, and stigmas yellow; segments spreading. April, May. *l.* narrow-obtuse. *h.* 9in. 1795. SYNS. *Gladiolus sulphureus, G. plicatus.* (B. M. 1053.)

B. s. villosa (villous).* *fl.*, perianth smaller than the last, with the narrower segments rather more widely spreading than in *B. s. rubro-cyanea*, brilliant crimson, with violet-blue anthers. August. *h.* 6in. 1778. (B. M. 583.)

BABINGTONIA (named after C. C. Babington, Professor of Botany at Cambridge, and a distinguished botanical author). ORD. *Myrtaceæ.* A very pretty greenhouse evergreen shrub, allied to *Bœckea*, from which it differs in having the stamens collected in groups opposite the sepals. Cuttings of the young unflowering shoots may be planted in sand under a bell glass, and kept in a moderate heat until rooted, when they should be placed singly in small pots, in a compost of equal parts loam and peat, with the addition of a little sand. As the small pots fill with roots, the plants should be removed into larger ones, and the compost have less sand in it; but this should not be done until the next February. The established plants must have a good shift about March or April, and should be kept in a light, airy greenhouse; the first shoots may be topped to moderate their vigour, and to produce a greater profusion of less luxuriant ones. In May, when most plants are removed from the greenhouse, these should be set to grow under a frame which, while shielding them from heavy rains, and supporting some slight shading in the hottest parts of the sunny days, will not prevent a free circulation of air. To this end, the frame should be elevated from the rests or supports at its corners; the lights should be left off at night in fine, mild weather, and on dull, cloudy days, being only replaced during heavy rains, and when shading is necessary. Towards autumn, the plants must be returned to the greenhouse.

B. Camphorasmæ (camphor-smelling).* *fl.* pinkish-white, in little cymes, disposed in long terminal racemes. Summer. *l.* linear, opposite, nerved. *h.* 7ft. Australia, 1841. (B. R. 28, 10.)

BACCATE. Berried, fleshy; having a pulpy texture.

BACCHARIS (from Bacchus, wine; referring to the spicy odour of the roots). Ploughman's Spikenard. ORD. *Compositæ.* A genus of hardy, stove, or greenhouse herbs, shrubs, or trees. Flower-heads many-flowered, dicœcious, terminal. Involucre sub-hemispherical or oblong, in many series, imbricated. Leaves simple, alternate, exstipulate, deciduous, oblong-lanceolate, notched, serrated, or entire. Shrubs of short duration. These plants are neither beautiful nor ornamental, but are of easy cultivation in ordinary soil. Propagated by cuttings.

B. halimifolia (Halimus-leaved). Groundsel Tree. *fl.-heads* white. July. *l.* oblong-cuneate, obovate, coarsely toothed; branches angular. *h.* 6ft. to 12ft. Northern United States, 1683. Hardy.

BACHELORS' BUTTONS. The double-flowered forms of *Ranunculus acris, Lychnis diurna,* &c.

BACKHOUSIA (commemorative of the late James Backhouse, a botanical traveller in Australia and South Africa). ORD. *Myrtaceæ*. A greenhouse evergreen shrub, requiring a compost of fibry peat, loam, and a little white sand. Propagated, in April, by half-ripened cuttings, inserted in sand, under a bell glass, in a cool house.

B. myrtifolia (Myrtle-leaved).* *fl.* white, disposed in corymbs, and often produced on cuttings soon after having struck root. May. *l.* ovate, acuminate, smooth. Branches slender. *h.* 16ft. New South Wales, 1844. (B. M. 4133.)

BACONIA. A synonym of **Pavetta** (which *see*).

BACTRIS (from *baktron*, a cane; the young stems being used for walking sticks). ORD. *Palmæ*. Very ornamental, slender growing, and prickly stove Palms. Peduncle of the spadix bursting through about the middle of the leaf sheath. Drupes small, ovate, or nearly round, and generally of a dark blue colour. Leaves pinnatisect; segments generally linear and entire. Instead of being confined to the apex of the trunk, the leaves are scattered over nearly the whole surface, and the lower ones retain their verdure long after the upper ones have fully developed. Stems slender, varying from 2ft. to 10ft. in height. Some of the species are of easy culture in a compost of loam, peat, leaf mould, and sand, in equal parts; but most of them are very difficult to manage. Propagation may be effected by suckers, which are very freely produced. Many species are ornamental only when in a young state.

B. baculifera (cane-bearing). *l.* pinnate, bifid at the apex, 2ft. to 6ft. long; pinnæ arranged in clusters about 1ft. long and 2in. broad, dark green above, paler below; petioles sheathing and densely clothed with sharp brown and black spines, 1½in long. South America.

B. caryotæfolia (Caryota-leaved).* *fl.*, spathe ovate, prickly; branches of spadix simple, flexuous. *l.*, pinnæ wedge-shaped, three-lobed, and erose; rachis, petioles, and caudex prickly. *h.* 30ft. Brazil, 1825.

B. flavispina (yellow-spined). Synonymous with *B. pallidispina*.

B. major (greater). *fl.* greenish-yellow, with a broadly ovate spathe. *h.* 25ft. Carthagena, 1800.

B. Maraja (Maraja). Maraja Palm. *fl.* yellow, with a prickly spathe. *h.* 30ft. to 50ft. Bahia, 1868.

B. pallidispina (pale-spined).* *l.* pinnate, bifid at the apex; pinnæ clustered, 6in. to 12in. long, 1in. wide, dark; petioles sheathing at the base and furnished with a profusion of long, yellow spines, which are tipped with black. Brazil. SYN. *B. flavispina*.

BACULARIA (from *baculum*, a walking-stick). ORD. *Palmæ*. A small genus containing a couple of stove species, which are amongst the smallest Palms of the Old World. Both are confined to the east coast of tropical Australia. *B. monostachya*—in allusion to its slender stem, which rarely exceeds in thickness that of the thumb—is known as the Walking-stick Palm.

B. minor (lesser). *l.* attaining 3½ft. Stems, several from same rhizome, 2ft. to 5ft. high, ½in. thick. Queensland.

B. monostachya (one-spiked). *l.* pinnate, pendent, 6in. to 12in. long, bifid at the apex; pinnæ about 4in. across, broad, irregular in shape, with ragged and irregular ends; dark green. Stem slender, petioles sheathing. *h.* 10ft. New South Wales, 1824. SYN. *Areca monostachya*. (B. M. 6644.)

BADGER'S BANE. *See* **Aconitum meloctonum**.

BÆA (commemorative of Rev. Dr. Beau, of Toulon, brother-in-law to Commerson, the discoverer of the genus). SYN. *Dorcoceras*. ORD. *Gesneraceæ*. Curious and pretty greenhouse herbaceous perennials, requiring a rich sandy loam. They are easily propagated by seeds. Probably the only species in cultivation is the following:

B. hygrometrica (hygrometric).* *fl.* pale blue-coloured, yellowish at the throat; segments of the limb more or less reflexed; corolla five-lobed, somewhat resembling that of the Violet; scapes numerous, naked, few-flowered. Summer. *l.* in a rosette, thinly covered with coarse white hairs, ovate acute at both ends, crenate serrate. *h.* 6in. North China, 1868. (B. M. 6468.)

BÆCKEA (named after Abraham Bæck, a Swedish physician, and an esteemed friend of Linnæus). ORD. *Myrtaceæ*. Very pretty greenhouse evergreen shrubs. Flowers white, pedicellate, small. Leaves opposite, glabrous, dotted. They thrive in a compost of sandy peat, leaf soil, and lumpy, fibrous loam. Cuttings, taken from young wood, root readily, if pricked in a pot of sand, with a bell glass placed over them, in a cool house.

Bæckea—*continued*.

B. diosmæfolia (Diosma-leaved).* *fl.* axillary, solitary, approximate, sessile. August to October. *l.* oblong, rather cuneated, keeled, acute, crowded, imbricate, and are, as well as the calyces, ciliated. *h.* 1ft. to 2ft. New Holland, 1824.

B. frutescens (shrubby).* *fl.* solitary; pedicels axillary. November. *l.* linear, awnless. *h.* 2ft. to 3ft. China, 1806. (B. M. 2802.)

B. parvula (little). *fl.*, peduncles axillary, umbelliferous. *l.* elliptic-oblong, obtuse, rather mucronate. *h.* 1ft. New Caledonia, 1877. This is very close to *B. virgata*. (R. G. 886, 2.)

B. virgata (twiggy).* *fl.*, peduncles axillary, umbelliferous. August to October. *l.* linear-lanceolate. *h.* 2ft. to 3ft. New Caledonia, 1806. (B. M. 2127.)

BÆRIA (named in honour of Professor Baer, of the University of Dorpat). ORD. *Compositæ*. A genus consisting of about half a dozen species. Probably the only one in cultivation is that mentioned below; it is a very pretty plant, of easy culture in ordinary garden soil. Propagated by seeds, sown in spring.

B. chrysostoma (golden-mouthed). *fl.-heads* bright yellow, solitary, terminal, about 1in. across; involucre of about ten leaflets, in two series. Early summer. *l.* linear, opposite, entire. Stems erect, downy. *h.* 1ft. California, 1835. (S. B. F. G. ii. 395.)

BAGGED. Swelled like a sac or bag.

BAHIA (probably from Port of Bahia, or San Salvador, in South America). SYN. *Phialis*. ORD. *Compositæ*. An ornamental, hardy, herbaceous perennial, much branched from the base of the stem, and having a greyish appearance. It may be increased by seeds, or by divisions.

B. lanata (woolly). *fl.-heads* yellow, solitary, produced in great numbers. Summer. *l.* alternate, or with the lower ones sometimes opposite, deeply divided, and sometimes ligulate and entire. *h.* 6in. to 15in. North America. This species thrives on borders of light and well-drained sandy soil. (B. R. 1167.)

BALANINUS. *See* **Nut Weevil.**

BALANTIUM (of Kaulfuss). *See* **Dicksonia.**

BALANTIUM (of Desvaux). *See* **Parinarium.**

BALBISIA (commemorative of Giovanni Battista Balbis, a Professor of Botany at Turin). SYN. *Ledocarpum*. ORD. *Geraniaceæ*. A very ornamental half-hardy evergreen shrub, requiring a cool, dry atmosphere. As it is very liable to rot off, water must be applied with great care. Propagated by cuttings of half-ripened wood, inserted in sand, under a hand glass; or by seeds.

B. verticillata (whorled). *fl.* yellow, large, with a whorl of narrow bracts beneath. Autumn. *l.* opposite, three-parted; segments linear-oblong. Branches slender, glaucous. *h.* 3ft. to 6ft. Chili, 1846. (B. M. 6170.)

BALCONY. A projection from the external wall of a house, usually resting on brackets, and having the sides encompassed by a balustrade. It should at all times be prettily decorated with plants, which in the summer is a comparatively easy matter. During winter, evergreens of various kinds are most serviceable, the best being Arbutus, Aucubas, Boxes, Euonymuses, Hollies, Irish and Goldon Yew, Portugal Laurel, Retinosporas, Vincas, &c. These may be grown in pots, and when replaced by the summer occupants, should be plunged in some reserve quarter, where they should receive plenty of water; by this means, they will increase in size, and keep in a healthy condition. Very little water will be required during the winter. Climbing plants, such as Ivy, Passion Flower, Virginian Creeper, Climbing Roses, &c., are indispensable for covering the trellises, and draping the pillars and arches.

BALDINGERA. A synonym of **Premna.**

BALL. This term is used in reference to the roots and mass of earth as they are moulded into form and pressed into hardness by the pot. The masses of roots and earth which, in the case of fibrous-rooted subjects (such as Rhododendrons), must be taken intact when removing the plants, are also termed Balls.

BALM (*Melissa officinalis*). A perennial herb, often used in the manufacture of a drink for sick persons, and sometimes employed for culinary purposes. It may be grown in ordinary garden soil, and is propagated by

Balm—*continued.*

divisions, in spring. A pretty variegated form is sometimes met with, having the additional advantage of being equal to the normal species for medicinal purposes.

BALM OF GILIAD. *See* **Cedronella triphylla** and **Populus balsamifera.**

BALSAM (*Impatiens Balsamina*). A well-known ornamental and tender annual, native of India. It is one of the showiest of summer and autumn flowers, and well deserves a place in every garden. Although of comparatively easy cultivation, good blossoms and well-grown plants are far too rarely seen. A good Balsam flower should be quite as double as a perfect Camellia, and to show to the greatest advantage should appear like one in the arrangement of the petals. To secure this, seeds should only be saved from the finest and most perfect flowers, although the quantity must, of necessity, be small. They should be sown, about the third week in March, in properly prepared pans of rich sandy soil, and placed in a gentle bottom heat of about 65deg. As soon as the first rough leaf appears, the plants should be potted off into 3in. pots, care being taken to let the cotyledon, or seed leaves, be close to the

FIG. 201. CAMELLIA-FLOWERED BALSAM.

soil. When the roots touch the sides of the pots, the plants should be moved into larger ones, and this should be repeated until they are in 8in. or 10in. pots. Some growers place one or two seeds in small pots, so as to avoid the first shift, and a good plan it is. During the time the plants are under glass, they should be kept as near the light as possible, and be frequently turned around, so that they do not draw to one side; and careful training must be given to those that are required in fine form. Disbudding is also necessary to such as are wanted at their best, removing all blossom from the main stem and base of branches until the plants are of sufficient size, and then the buds at the tops will flower almost simultaneously. The buds that will be formed afterwards will cause a continuance of blossom for a long time, in fact, for some months, if the plants are liberally supplied with liquid manure. If it is desired for them to flower out of doors, the plants should be transferred, about May, to a frame where the heat is not above 50deg., and be kept in a steady growing state, air being admitted on all suitable occasions, cold winds and heavy rains avoided, and water supplied when needed; never allow them to get dry. They require training and disbudding the same as those grown in the

Balsam—*continued.*

greenhouse. About June, the plants should be fully exposed during the day; and, when danger of frost is over, the lights may be kept off altogether. These should flower at the end of July. In all cases, plenty of drainage must be allowed, as the amount of water required is very great. Insects must be sharply looked after, as well as slugs and snails. There are several sections, such as Camellia-flowered (see Fig 201), Rose-flowered, &c., each containing variously striped, spotted, and entire coloured blossoms, and it is best to pay an extra figure to secure a good strain.

BALSAM APPLE. *See* **Momordica Balsaminea.**

BALSAMINA. *See* **Impatiens.**

FIG. 202. BAMBUSA ARUNDINACEA.

BALSAMINEÆ. A tribe of plants belonging to the order *Geraniaceæ*. Sepals and petals all coloured, consisting of six segments, "two outer ones small, flat, and oblique; the next large, hood-shaped, ending below in a conical spur; the fourth opposite to it, small, very broad, concave; the two innermost very oblique, and more or less divided into two unequal lobes." The best known genus is *Impatiens*.

BALSAMODENDRON (from *balsamon* — an old Greek word used by Theophrastus—balm or balsam, and *dendron*, a tree). ORD. *Burseraceæ*. Greenhouse or stove balsamiferous trees. Flowers small, green, axillary, often unisexual; calyx four-toothed, permanent; petals four, linear-oblong, induplicately valvate in æstivation; stamens eight, inserted under the annular disk, having elevated warts between them. Berry, or drupe, ovate,

Balsamodendron—*continued.*

acute, one to two-celled, marked with four sutures. Leaves with three to five sessile, dotless leaflets. They thrive in a compost of thoroughly drained sandy loam. Propagated by cuttings of ripe young wood, taken in April, and placed under a hand glass, in bottom heat. The species named below doubtfully belongs to this genus, as the characteristics above enumerated will show.

B. zeylanicum (Ceylon).* *fl.* white, three-petaled, glomerated, involucrated; racemes interrupted, downy. *l.* impari-pinnate, with five to seven-stalked, ovate, acute leaflets. *h.* 30ft. Ceylon.

BALSAM OF CAPEVI. *See* **Copaifera.**

BALSAM-TREE. *See* **Clusia.**

BAMBOO CANE. *See* **Bambusa.**

BAMBUSA (from *bambu*, the Malay name). Bamboo Cane. ORD. *Gramineæ*. A genus of ornamental, shrubby, greenhouse, half-hardy or hardy shrubs, each culm flowering but once. Flowers usually hexandrous. Leaves, as a rule, relatively shorter than the stems, lanceolate, and narrowed at the base. Stems jointed, flexuose, branching, usually hollow, and, when mature, of a hard, woody nature. In well drained, sheltered situations, in the open, with rich, loamy soil, some of the species make extremely graceful objects, particularly so in the more southern counties of England, and in parts of Scotland. Unless a very severe winter is experienced, they may be left without protection. Plants of all the species, however, should have the shelter of a cold greenhouse till about the end of April; when they should be gradually hardened off, and transferred to a

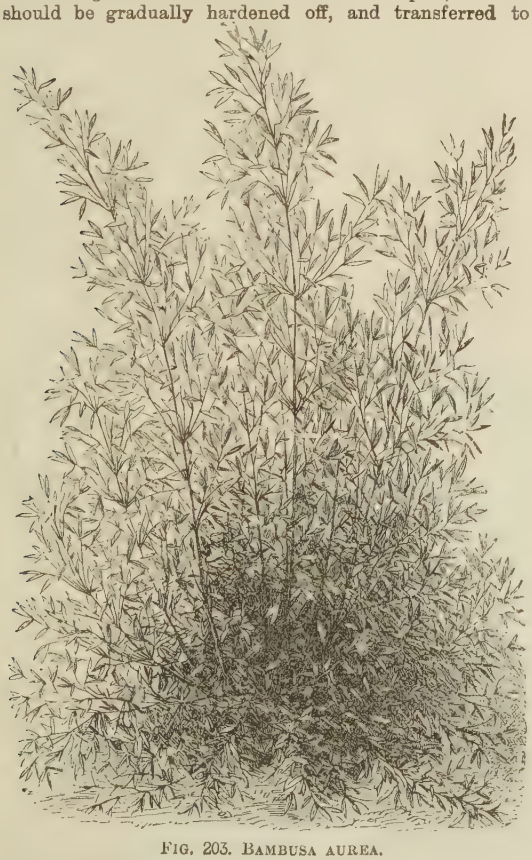


FIG. 203. BAMBUSA AUREA.

warm, sheltered spot, such as in woodlands, by the margins of lakes, &c., as they like plenty of moisture during

Bambusa—*continued.*

the summer. A good watering must be given after planting, to settle the soil. Propagation is effected by careful

FIG. 204. BAMBUSA NANA.

division of well-developed plants, which should be done in early spring, just as new growth is commencing; and it is advisable to establish the divisions in pots. *See also* **Arundinaria.**

B. arundinacea (Reed-like).* Stem very stout, rising like a beautiful column to some 50ft. or 60ft. in height; the laterals producing a profusion of light green leaves, the whole presenting the appearance of a huge plume of feathers. India, 1730. This species is best treated as a stove plant, but it may be placed out of doors in summer. See Fig. 202. (B. F. S. 321.)

B. aurea (golden).* *l.* lanceolate, acute, light green, distinguished from *B. nana* by having their under surface less glaucescent, and the sheath always devoid of the long silky hairs. China. This very handsome species forms elegant tufts, with its slender much-branched stems, which attain a height of from 6ft. to 10ft., and are of a light green colour in a young state, ultimately changing into a yellowish hue. Hardy in most parts of the country. See Fig. 203.

B. Fortunei (Fortune's).* *l.* linear-lanceolate, abruptly pointed, somewhat rounded at the base, on very short hairy stalks, serrated and often fringed with long hairs on the margin, downy on both sides, and distinctly variegated, the transverse veins often of a bottle-green colour. *h.* 1ft. to 2ft. Japan. A dwarf tufted species, with very slender stem. Quite hardy. There are only variegated varieties of this in cultivation, viz., *variegata* and *argenteo-vittata*. (F. d. S. 1863, t. 1535.)

B. glauca (milky-green). A synonym of *B. nana*.

B. japonica (Japanese). Synonymous with *Arundinaria Metake*.

B. Maximowiczii (Maximowicz's). Synonymous with *Arundinaria Maximowiczii*.

B. Metake (Metake). Synonymous with *Arundinaria Metake*.

B. mitis (small). *l.* deep green, lanceolate, acute, striated, clasping the stem; panicle simple, erect, close; spikes long, imbricated. Stem tapering. *h.* 40ft. Cochin China and Japan. This

Bambusa—*continued.*

vigorous-growing species can be cultivated out of doors during summer, and, in most localities, it may be left out all the year.

B. nana (dwarf).* *l.* lanceolate, acute, glaucous, stoutish, with the footstalks slightly downy. *h.* 6ft. to 8ft. India, 1826. A rather tender species, requiring to be grown in the stove or greenhouse. SYNS. *B. glauca* and *B. viridi-glaucescens.* See Fig. 204.

B. nigra (black). *See* **Phyllostachys nigra.**

B. Ragamowski (Ragamowsk's).* *l.* 9in. to 18in. long, and about 1in. to 3in. broad. China and Japan. This species "can readily be recognised by the tomentose line on one side of the midrib, running nearly the whole length of the leaf on the underside, this line being always on the longer side of the leaf." Hardy. SYN. *B. tessellata.*

B. Simonii (Simon's).* *l.* narrow, nearly 6in. to 10in. long, occasionally striped with white. Stems growing with great rapidity, mealy-glaucous at the joints; branchlets numerous, rather closely crowded. *h.* 10ft. China and Japan, 1866.

B. striata (striated).* *l.* linear-oblong; culms striped yellow and green. *h.* 6ft. to 20ft. China, 1874. A very slender and graceful, rather tender, species. May be grown in the open air during summer, and in very favoured spots it is probably hardy, especially if covered with a mat in winter. It makes an excellent pot plant. SYN. *B. viridi-striata.* (B. M. 6079.)

B. tessellata (tessellated). A synonym of *B. Ragamowski.*

B. violescens (nearly-violet).* *l.* green above, bluish-grey beneath, with an elongated ligule, surrounded by a bundle of black hairs. Stems much branched, blackish-violet. China, 1869. This handsome and vigorous species is intermediate between *Phyllostachys nigra* and *B. nana.* It requires protection during winter.

B. viridi-glaucescens (glaucous-green). A synonym of *B. nana.*

B. viridi-striata (green-striped). A synonym of *B. striata.*

BANANA, or **PLANTAIN.** *See* **Musa.**

BANEBERRY. *See* **Actæa.**

BANISTERIA (named after John Baptist Banister, a traveller in Virginia in the seventeenth century, author of a catalogue of Virginian plants, inserted in Ray's "Historia Plantarum"). ORD. *Malpighiaceæ.* Stove trees or shrubs, frequently climbing. Flowers yellow; calyx five-parted; petals furnished with long stalks; stamens ten. Leaves simple, stalked. They are for the most part very ornamental, but are not often seen in flower in this country. They will grow in a mixture of loam, leaf soil, and peat, with some sharp sand added. Cuttings, made from ripened wood, will root freely in sandy soil, under a hand glass, in stove heat, taking about three or four weeks to do so.

B. chrysophylla (golden-leaved).* *fl.* deep orange, axillary, corymbose. *l.* ovate, oblong, acutish, somewhat sinuated towards the top, clothed beneath with golden shining down. Brazil, 1793. Climber.

B. ciliata (ciliated).* *fl.* large, orange-coloured, umbellate. June. *l.* cordate, orbicular, smooth, ciliated. Brazil, 1796. Twiner.

B. ferruginea (rust-coloured). *fl.* yellow; racemes panicled. June. *l.* 2in. long, ovate, acuminated, smooth above, and shining, rusty beneath, and are, as well as the petioles, clothed with close pressed hairs. Brazil, 1820. Climber.

B. fulgens (glowing).* *fl.* yellow, in umbellate corymbs. *l.* ovate, acuminated, smooth above, and clothed with silky pubescence beneath, as well as the petioles. Branches dichotomous. West Indies, 1759. Climber.

B. Humboldtiana (Humboldt's).* *fl.* yellow; umbels lateral and terminal, sessile. *l.* roundish-ovate, cordate, rather acuminated, mucronate, membranaceous, smoothish above, clothed beneath with soft hoary down as well as the branchlets. South America, 1824. Climber.

B. sericea (silky). *fl.* yellow, racemose. July. *l.* ovate, obtuse, with a mucrone; younger ones downy on both surfaces, adult ones only on the under surface; down of a golden shining colour. Brazil, 1810. Climber.

B. splendens (splendid).* *fl.* yellow; racemes axillary, dichotomous, umbellate. Floral leaves orbicular, and nearly sessile. *l.* cordate, kidney-shaped, orbicular, clothed with silky down beneath. South America, 1812. Climber.

BANKS. These are usually formed with a view to increasing the amount of surface ground, and for the acceleration or retarding of vegetable crops, such as strawberries, &c. They should be from 6ft. to 12ft. apart, according to the depth of soil, and run from east to west. In constructing Banks of a uniform size, great care, and a constant use of the garden line, will be found necessary. For the warmest side of the Banks, Dwarf French Beans, Peas, Vegetable Marrows, Cucumbers, New Zealand Spinach, Capsicums, &c., may be grown. On the opposite side, and

Banks—*continued.*

when a prolonged supply is desired, Cauliflower, Broccoli, Lettuce, Turnip, Spinach, &c., may be sown thinly in drills, to be thinned out, and remain. It needs but little discretion to produce valuable crops by this method.

BANKSIA (named in honour of Sir Joseph Banks, once President of the Royal Society, and a distinguished patron of science, particularly of Natural History). ORD. *Proteaceæ.* Greenhouse evergreen shrubs, natives of Australia, principally grown for the beauty of their foliage. Leaves variable in form, usually dark green, clothed with white or rufous down beneath; margins deeply serrated or spinous, rarely entire. The following is the mode of culture recommended many years ago by Sweet. The pots should be well drained, by placing a potsherd about half way over the hole at the bottom of the pot, then laying another piece against it that it may be hollow, afterwards putting some smaller pieces all around them, and on the top of these some others broken very small. All the plants belonging to the order *Proteaceæ* should be drained in a similar manner, as the roots are very fond of running amongst the broken potsherds, and consequently there is less danger of their being overwatered. Care must also be taken not to allow them to flag, as they seldom recover if once allowed to get very dry. The plants should be placed in an airy part of the house when indoors. Cuttings are generally supposed to be difficult to root, but this is not the case if properly managed. Let them be well ripened before they are taken off; then cut them at a joint, and place them in pots of sand, without shortening any of the leaves, except on the part that is planted in the sand, where they should be taken off quite close. The less depth they are planted in the pots the better, so long as they stand firm when the sand is well closed round them. Place them under hand glasses in the propagating house, but do not plunge them in heat. Take the glasses off frequently to give them air, and dry them, or they will probably damp off. When rooted, transfer to small pots; after which, place them in a close, unheated frame, and harden by degrees. Seeds are a very unsatisfactory means of multiplying the stock.

B. æmula (rivalling).* *l.* 6in. to 10in. long, 1in. broad, linear-oblong, tapering slightly at the base; edges deeply toothed, deep green on both sides; midrib of under surface clothed with rich brown hairs. *h.* 20ft. 1824. SYN. *B. elatior.* (B. M. 2671.)

B. australis (southern). A synonym of *B. marginata.*

B. Caleyi (Caley's). *l.* 6in. to 12in. long, linear, deeply and regularly toothed from base to apex, dark green above, paler below. *h.* 5ft. to 6ft. 1830. Said to be an elegant species.

B. collina (hill-loving).* *l.* 2in. to 3in. long, ¼in. broad, linear; apex præmorse, as if bitten straight off; upper surface dark green, silvery below. *h.* 6ft. to 8ft. 1822. This forms a dense and handsome shrub, especially with its large head of yellow flowers. SYNS. *B. Cunninghami, B. ledifolia,* and *B. littoralis.* (B. M. 3060.)

B. Cunninghami (Cunningham's). A synonym of *B. collina.*

B. dryandroides (Dryandra-like).* *l.* 6in. to 10in. long, ¼in. broad, pinnatifid, divided almost to the midrib; lobes triangular, deep green above, and reddish-brown below. Stem clothed with reddish-brown hairs. *h.* 6ft. 1824. This plant is extremely graceful and elegant as a table decoration.

B. elatior (taller). Synonymous with *B. æmula.*

B. integrifolia (entire-leaved). *l.* cuneate-oblong, 6in. long, nearly 1in. wide at the broadest part; edges entire; upper side dark green, silvery white beneath. *h.* 10ft. to 12ft. 1788. SYNS. *B. macrophylla, B. oleifolia.* (B. M. 2770.)

B. i. compar (well-matched). *l.* very densely set upon the branches, oblong, tapering at the base, blunt at the apex; edges serrulate; upper side dark olive green, silvery white beneath. *h.* 6ft., finely branching. 1824.

B. latifolia (broad-leaved). *l.* 6in. to 10in. long, 3in. broad, obovate-oblong; edges serrated; upper surface deep green, beneath clothed with woolly greyish hairs, those on the midrib bright brown. *h.* 20ft. 1802. (B. M. 2406.)

B. ledifolia (Ledum-leaved). Synonymous with *B. collina.*

B. littoralis (shore). Synonymous with *B. collina.*

B. macrophylla (large-leaved). Synonymous with *B. integrifolia.*

B. marginata (margined). *l.* 1in. to 2in. long, ¼in. broad, blunt at the apex, armed with several short spines, and tapering at the base, deep green on the upper surface, snowy white beneath. *h.* 5ft. to 6ft. 1822. SYN. *B. australis.* (B. M. 1947.)

Banksia—*continued.*

B. occidentalis (western).* *fl.* yellow, rather handsome, in spikes about 4in. long. April to August. *l.* 5in. to 6in. long, ¼in. broad. *h.* 5ft. 1803. West coast of New Holland. A beautiful species. (B. M. 3535.)

B. oleifolia (Olive-leaved). Synonymous with *B. integrifolia.*

B. Solanderi (Solander's).* *l.* 4in. to 6in. long, and over 2in. wide, deeply pinnatifid, with three to six pairs of lobes on each leaf; apex as if bitten off; upper side dark green, under silvery white. *h.* 6ft. 1830.

B. speciosa (showy).* *l.* 8in. to 14in. long, about ½in. wide, pinnatifid, but divided almost to the midrib; lobes semicircular, with a spine on the end of each; upper side deep green, beneath silvery white, with the midrib clothed with ferruginous woolly hairs. *h.* 6ft. 1805. Both this and the preceding species are very handsome, and highly deserving of the most extensive culture.

B. quercifolia (Oak-leaved). *l.* cuneate-oblong, deeply incised at the margins, and having a short spine upon each lobe. *h.* 5ft. 1805. (B. R. 1430.)

BANKSIA (of Forster). A synonym of **Pimelea.**

BAOBAB-TREE. *See* **Adansonia.**

BAPHIA (from *baphe*, a dye; the tree produces the camwood of commerce). Camwood or Barwood. ORD. *Leguminosæ.* A stove tree, requiring a loam and peat soil. Cuttings, not deprived of any of their leaves, will root in a pot of sand, under a hand glass, in heat.

B. nitida (shining). *fl.* white; corolla with a roundish spreading vexillum, linear wings, which are about the length of the vexillum, and an acute carina; pedicels two to three together, one-flowered, axillary. June. *l.* entire, oval-oblong, acuminated, shining. *h.* 30ft. Sierra Leone, 1793. (L. B. C. 367.)

BAPTISIA (from *bapto*, to dye; so named from the economical use of some of the species). ORD. *Leguminosæ.* North American hardy herbaceous plants, with trifoliate, rarely simple leaves, and racemes of yellowish or blue flowers. They are somewhat shy blossomers, but grow freely in a loamy soil. Propagated by divisions, or, more easily, by seed, which latter may be sown in sand and leaf mould in the open, or in pots placed in a cold frame.

B. alba (white).* *fl.* white; racemes terminal. June. *l.* stalked, glabrous; leaflets elliptic-oblong, obtuse; stipules deciduous, subulate, shorter than the petioles. Branches divaricate. *h.* 2ft. 1724. (B. M. 1177.)

B. australis (southern).* *fl.* blue; racemes few-flowered, elongated, shorter than the branches. June. *l.* stalked, smooth; leaflets oblong-cuneated, obtuse, four times longer than the petiole; stipules lanceolate, acute, twice the length of the petiole. Stem branched, diffuse. *h.* 4ft. to 5ft. 1758. (Flora, 1856, 2; B. M. 509.)

B. confusa (confused). *fl.* dark blue, alternate, bracteate; racemes elongated. June. *l.* stalked, smooth; leaflets oblong-cuneated or obovate; stipules linear-lanceolate, twice the length of the petioles. Stem branched. *h.* 1ft. to 2ft. 1758.

B. exaltata (exalted).* *fl.* deep blue; racemes many-flowered, elongated, twice the length of the branches. June. *l.* ternate, stalked; leaflets lanceolate-obovate, five times longer than the petioles; stipules lanceolate, acuminated, three times longer than the petioles. Stem erect, branched. *h.* 3ft. to 4ft. 1812. (S. B. F. G. 97.)

B. leucophæa (dusky-white). *fl.* cream-coloured; racemes many-flowered, lateral, with the flowers leaning to one side. July. *l.* sessile, somewhat villous; leaflets rhomboid-obovate; stipules and bracts ovate, acute, broad, leafy. *h.* 1ft. 1870. (B. M. 5900.)

B. minor (less). *fl.* blue; racemes axillary, bracteate. June. *l.*, leaflets rhomboid-lanceolate; stipules lanceolate, longer than the petioles. Stem erect, solid. *h.* 1ft. to 2ft. 1829.

B. perfoliata (perfoliate-leaved).* *fl.* yellow, small, axillary, solitary. August. *l.* perfoliate, roundish, quite entire, rather glaucous. *h.* 3ft. 1793. (B. M. 3121.)

B. tinctoria (dyers').* *fl.* yellow, with wings each furnished with a callosity, or lateral tooth; racemes terminal. *l.* stalked, upper ones nearly sessile; leaflets roundish-obovate; stipules setaceous, almost obsolete. *h.* 2ft. to 3ft. 1759. (L. B. C. 588.)

BARBACENIA (named after M. Barbacena, a Governor of Minas Geraes). Formerly placed in ORD. *Hæmodoraceæ*, but now referred by Bentham and Hooker to *Amaryllideæ.* Very singular and pretty greenhouse evergreen herbaceous perennials, allied to *Vellozia.* Flowers purple, large, showy; perianth funnel-shaped, resinosely hairy on the outside; limb spreading; scapes one-flowered, usually clothed with glandular hairs. Leaves firm, spiral, spreading, acutely keeled. Lindley says the plants are capable of existing in a dry hot air, without contact with

Barbacenia—*continued.*

the earth, on which account they are favourites in South American gardens, where, with Orchids and Bromeliads, they are suspended in the dwelling houses, or hung to the balustrades of the balconies, in which situation they flower abundantly, filling the air with their fragrance. They are rarely seen in our gardens. They may be grown in baskets of fibrous loam and peat, with some nodules of charcoal added.

FIG. 205. FLOWER OF BARBACENIA PURPUREA.

B. purpurea (purple).* *fl.* funnel-shaped, six-cleft, terminal, solitary; ovarium elongated, tuberculated. July. *l.* linear, keeled, with spiny serratures. *h.* 1½ft. Brazil, 1825. See Fig. 205. (B. M. 2777.)

B. Rogieri (Rogers').* *fl.*, scape and ovaria tubercled; filaments broad, bifid. July. *l.* linear, acuminated, imbricate, with broad stem-clasping bases, finely spinely serrated on the margin, and keel recurved; caudex short. *h.* 1½ft. Brazil, 1850. (L. J. F. 82.)

BARBADOS CHERRY. *See* **Malpighia.**

BARBADOS GOOSEBERRY. *See* **Pereskia aculeata.**

BARBADOS LILY. *See* **Hippeastrum equestre.**

BARBAREA (anciently called Herb of St. Barbara). Winter Cress; American Cress. ORD. *Cruciferæ.* Hardy glabrous perennial herbs. Flowers yellow; racemes erect, terminal. Stems erect. They are of easy culture, but scarcely worth growing in the pleasure garden. Propagated by cuttings, suckers, divisions, or seeds.

B. præcox (early). *l.*, lower ones lyrate; terminal lobe ovate; upper ones pinnate-parted; lobes linear-oblong, quite entire. *h.* 1ft. to 1½ft. Commonly known as American, or Black American Cress. Here and there on roadsides, and in dry gravelly places in Great Britain. An escape from cultivation. (Sy. En. B. 124.)

B. vulgaris (common). *l.*, lower ones lyrate; terminal lobe roundish; upper ones obovate, toothed, or pinnatifid. *h.* 1½ft. The double flowering form of this native species is the only one of this genus worth growing for beauty; it is generally known as Double Yellow Rocket. The variegated form is also rather pretty, and comes true from seed. (Sy. En. B. 120.)

BARBATUS. Having long weak hairs, in one or more tufts; bearded.

BARBERRY. *See* **Berberis.**

BARBIERIA (in honour of J. B. G. Barbier, M.D., a French physician and naturalist, author of "Principes Generaux de Pharmacologie ou de Matière Medicale," Paris, 1806). ORD. *Leguminosæ.* An ornamental stove evergreen, requiring a mixture of peat, loam, and sand. Propagated by cuttings of half-ripened wood, which should be placed in sand, under a glass, in stove heat.

B. polyphylla (many-leaved).* *fl.* scarlet, 2in. long; racemes axillary, few-flowered, shorter than the leaves. *l.* impari-pinnate, with nine to eleven pairs of elliptic-oblong, mucronate leaflets, pubescent in an adult state. Porto Rico, 1818. SYNS. *Clitoria polyphylla* and *Galactia pinnata.*

BARBS. Hooked hairs.

BARK. The outer integuments of a plant beyond the wood, and formed of tissue parallel with it.

BARK-BOUND. This condition is generally the result of very rich soil, or insufficient drainage. In most fruit trees a gummy exudation takes place. If caused by stagnancy, thorough drainage should immediately be effected. Scrubbing the stem is also recommended. Slitting the bark with a knife is likely to do more harm than good, particularly so in the hands of the inexperienced.

BARKERIA (name commemorative of the late G. Barker, of Birmingham, an ardent cultivator of orchids). ORD. *Orchideæ*. From a scientific point of view, this genus should be included in *Epidendrum*. Very handsome, deciduous, epiphytal, cool-house Orchids, having slender pseudo-bulbs, from 6in. to 12in. high, from the top of which the numerous flower-stems are produced. In a cool, airy temperature, these plants grow vigorously, suspended in pans or small baskets close beneath the glass, and slightly shaded with tiffany. They succeed well also on flat blocks of wood, on the top of which they should be tied, without any moss, as their freely-produced, thick, fleshy roots soon cling to the blocks. During the season of growth, a good supply of water is needed, and in hot weather it may be applied three or four times daily; the blocks and plants are best immersed in water; but when at rest, a slight watering twice or three times a week will suffice. Propagated by divisions, just previous to the commencement of new growth.

B. elegans (elegant).* *fl.* in loose racemes, four or five in each; each blossom about 2in. across; sepals and petals dark rose; lip reddish crimson, spotted and edged with a lighter colour. Winter. *h.* 2ft. Mexico, 1836. Of this beautiful slender-growing species, there are two or three varieties in cultivation. (B. M. 4784.)

B. Lindleyana (Lindley's).* *fl.*, raceme 2ft. long, very slender, bearing from five to seven blossoms near its apex; sepals and petals rosy purple; lip white, with a deep purple blotch at its apex. September, remaining in beauty for a considerable time. *h.* 2ft. Costa Rica, 1842. (B. M. 6098.)

B. L. Centeræ (Center's).* *fl.* rosy lilac; lip oblong; margins crenulated or crisped; apex blotched deep purple. Costa Rica, 1873.

B. melanocaulon (dark-stemmed).* *fl.* on an erect spike; sepals and petals rosy lilac; lip broader at the base than at the top, reddish-purple, having a blotch of green in the centre. August. *h.* 1ft. Costa Rica, 1848. Very rare.

B. Skinneri (Skinner's).* *fl.* deep rose-coloured; spikes 6in. to 9in. long, from the apices of the ripened growth, often branched, forming a dense mass of deep purple blossoms, which, if kept dry, lasts from eight to ten weeks. *h.* 1½ft. Guatemala. (P. M. B. 15, 1.)

B. S. superbum (superb).* *fl.* dark rose; lip somewhat deeper tinted, and marked towards the base with yellow streaks. Guatemala. This far surpasses the type in size and number of flowers, as well as in brilliancy of colour. (W. S. O. 38.)

B. spectabilis (showy).* *fl.* quite 2in. across, produced eight or ten together, on a spike issuing from the top of the pseudo-bulb; sepals and petals oblong, acuminate, rosy lilac; lip white, margined with deep lilac or rosy purple, and dotted or spotted with crimson. This very distinct and desirable species lasts from eight to ten weeks in beauty, and forms a very handsome object when placed in the drawing-room and covered over with a large glass shade. Guatemala, 1843. (B. M. 4094.)

BARKING-IRONS. Instruments used in taking off the bark of trees.

BARKLYA (named after Sir H. Barkly, formerly Governor of South Australia). ORD. *Leguminosæ*. A large greenhouse tree, thriving in a compost of loam and leaf mould. Propagated by seeds and cuttings; the latter should be half ripened, and placed in sandy soil, under a bell glass, in a cool house.

B. syringifolia (Syringa-leaved). *fl.* golden yellow, numerous, disposed in axillary or terminal racemes. *l.* alternate, simple, coriaceous. *h.* 30ft. Moreton Bay, 1858.

BARK STOVE. A hothouse adapted for moisture-loving exotics, and having a pit from 2ft. to 4ft. deep, containing fermenting matter, chiefly tanners' bark, by which means a steady heat is maintained for a considerable time. The Bark Stove is now almost obsolete. Bark is, however, still largely used in Pine pits, and in some propagating beds; but such beds are generally superseded by hot-water or hot-air tanks.

BARLERIA (named after J. Barrelier, a French botanist of the seventeenth century). ORD. *Acanthaceæ*. A genus of interesting and ornamental stove evergreen shrubs. Flowers axillary or terminal; calyx four-sepaled, the two outer larger than the others. They thrive best if grown in loam and peat, with a little rotten dung added. Propagated by cuttings made of the young wood, and placed in a similar compost, under a bell glass, in stove temperature, with bottom heat.

B. flava (yellow).* *fl.* yellow, aggregate, terminal, tubular; bracts very narrow, setose. Summer. *l.* lanceolate, hairy, entire. Plant unarmed. *h.* 3ft. India, 1816. SYN. *B. mitis*. (B. M. 4113.)

B. Gibsoni (Gibson's). *fl.* pale purple, rather large, sub-terminal. Winter. *l.* ovate or oblong-lanceolate. India, 1867. A glabrous stove shrub, of branched habit. (B. M. 5628.)

B. Leichtensteiniana (Leichtenstein's).* *fl.* very curious; spikes axillary, 2in. to 3in. long, ovoid or oblong, consisting of a large number of closely packed overlapping bracts, all turned to the fore or lower part of the spike; bracts ovate-acuminate, mucronate, spine-toothed, one-ribbed, with prominent and curved veins, and 1in. to 1½in. long. *l.* opposite, 1in. to 2in. long, linear-lanceolate, entire, mucronate, tapering at the base into a very short stalk. Branches slender, virgate, sub-angular. South Africa, 1870. This plant is covered over its whole surface with close, white, hoary down. (G. C. 1870, p. 73.)

B. longifolia (long-leaved). *fl.* white; spines of whorls six. Summer. *l.* ensiform, very long, rough. *h.* 2ft. India, 1781. This is a biennial.

B. lupulina (Hop-headed). *fl.* yellowish; spikes ovate; bracts ovate, concave, imbricated. August. *l.* lanceolate, quite entire; spines simple, spreading. *h.* 2ft. Mauritius, 1824.

B. Mackenii (MacKen's).* *fl.* purple, large, in a terminal raceme. Spring. *l.* recurved, narrow-ovate, or elliptic-lanceolate, sub-acute, petioled. Natal, 1870. (B. M. 5866.)

B. mitis (small). Synonymous with *B. flava*.

B. prionitis (Prionitis-like). *fl.* orange; spines axillary, pedate, in fours. Summer. *l.* quite entire, lanceolate-ovate. *h.* 3ft. India, 1759.

BARLEY. *See* **Hordeum vulgare.**

BARNADESIA (named after Michael Barnadez, a Spanish botanist). ORD. *Compositæ*. Pretty greenhouse deciduous shrubs, requiring a dry atmosphere. They should be grown in peat, loam, and sand, in equal proportions. Propagated either by seeds, sown in hotbeds in March, or by cuttings, made of half-ripened wood in April, and placed in sand under a bell glass.

FIG. 206. BARNADESIA ROSEA.

Barnadesia—*continued.*

B. rosea (rosy).* *fl.-heads* rose-coloured, solitary, ovate-cylindrical, downy, sessile; florets bilabiate, one lip oblong-emarginate, villous, the other filiform; hairs on receptacle twisted; pappus stiff, plumose. May. *l.* alternate, ovate, acute at both ends. *h.* 1½ft. South America, 1840. See Fig. 206. (B. M. 4232.)

BARNARDIA. Included under **Scilla** (which *see*).

BAROMETER. An instrument for measuring the density of the atmosphere, and hence determining the probable changes of weather, or the height of any ascent. To the gardener the Barometer is indispensable as a warning to take due precaution.

BAROSMA (from *barys*, heavy, and *osme*, smell; referring to the powerful scent of the leaves). Name often incorrectly spelt *Baryosma*. SYN. *Parapetalifera*. ORD. *Rutaceæ*. Very pretty small, Heath-like, greenhouse evergreen shrubs, from the Cape of Good Hope. Calyx equally five-parted; petals five, oblong; stamens ten. Leaves opposite or scattered, coriaceous, flat, dotted, with their margins sometimes glandularly serrulated, sometimes almost entire or revolute. They thrive in a mixture of sand, peat, and a little turfy loam, with good drainage and firm potting. Cuttings, taken from ripened wood, inserted in a pot of sand, and placed in a shady position in a cool house, with a bell glass over them, will root readily in a few weeks.

B. betulina (Birch-leaved). *fl.* white, axillary, solitary. February to September. *l.* opposite, obovate, serrulate, sessile, spreading. *h.* 1ft. to 3ft. 1790. (B. M. Pl. 45.)

B. dioica (diœcious).* *fl.* purplish; peduncles axillary, usually in threes, shorter than the leaves. April. *l.* scattered; upper ones ternate, lanceolate, tapering to both ends, full of glandular dots, spreading. *h.* 1ft. to 2ft. 1816. (B. R. 502.)

B. latifolia (broad-leaved). *fl.* white, usually solitary, lateral. July. *l.* opposite, ovate-oblong, sessile, serrulated, smoothish, without glandular dots; branches villous. *h.* 1ft. 1789.

B. pulchella (pretty).* *fl.* pale red or purple; peduncles axillary, usually solitary, exceeding the leaves. February. *l.* crowded, ovate, quite smooth, with thickened, crenate-glandular margins. *h.* 1ft. to 3ft. 1787.

B. serratifolia (saw-edged-leaved).* *fl.* white; peduncles axillary, sub-divided. March to June. *l.* nearly opposite, lanceolate, stalked, glandularly serrulated, smooth. *h.* 1ft. to 3ft. 1789. (B. M. 456, and B. Z. 1853, 12.)

BARRED. Marked in spaces with a paler colour, resembling bars.

BARREN FLOWERS. The male or staminate flowers of many plants, such as the Cucumber, Melon, &c., are popularly known as Barren Flowers, *i.e.*, they produce no fruit. This condition is, in some respects, similar to "blind" Strawberries or "blind" Cabbages, so far as fruition is concerned, but structurally and functionally it is widely different. The Barren Flowers of the Cucumber, Melon, &c., are produced by what are known as monœcious plants, *i.e.*, having male and female organs in different flowers, but on the same plant. In the Strawberry, &c., Barren Flowers are generally the result of unfavourable surroundings, or unskilful cultivation. A good example of Barren Flowers is seen in the ray-florets of many Composite plants, which are frequently really neuter, having neither male nor female organs.

BARREN SOILS. A term signifying such soils as are normally unprofitable. The term can only be correctly applied in very few cases; as almost any soil may be rendered capable of affording a basis for some kind of vegetable life, arboreal or other. The question of planting up the enormous quantity of what is now waste land, might well engage the most practical consideration. Of course, the natural state of any land will, to a great extent, determine what would be its ultimate condition, after all that could be effected by mechanical agency has been accomplished. Drainage, irrigation, enrichment, pulverisation, are all matters which can only be considered upon a particular basis; but we doubt not that the thousands of acres of land now practically almost useless, might, by the adoption of proper means, be rendered fairly remunerative.

BARREN-WORT. *See* **Epimedium.**

BARRINGTONIA (named after the Hon. Daines Barrington, F.R.S.). ORD. *Myrtaceæ*. A genus of stove evergreen trees and shrubs, very difficult to cultivate. Flowers large, racemose. Leaves opposite or whorled, generally obovate; margins toothed or entire. Fruit one-seeded, fleshy. They require a compost of two parts loam, one peat, and one sand. Water should be given in abundance, and a moist atmosphere at all times maintained, the temperature ranging from 65deg. to 95deg. Propagated by cuttings obtained from the lateral shoots; these, taken off at a joint when the wood is ripe, planted in sand, with a hand glass over them, root readily. The cuttings should not be stripped of any of their leaves.

B. racemosa (raceme-flowered). *fl.* red; racemes pendulous, very long. *l.* cuneate-oblong, acuminated, serrulated. *h.* 30ft. Malabar, 1822. (B.M. 3831.)

B. speciosa (showy).* *fl.* purple and white, large and handsome, disposed in an erect thyrse. *l.* shining, cuneate-oblong, obtuse, quite entire. *h.* 20in. to 30in. in England. This beautiful species seldom attains a height of more than 6ft. or 8ft. (G.C. 1845, p. 56.)

BARROW. Garden Barrows are very numerous, both with and without wheels. The Flower-pot Barrow has a wheel and a flat surface, on which plants, pots, or leaves are placed, either directly, or, when small, in shallow baskets. The Haum Barrow is an open box or case, of wicker or other work, placed on, or suspended from, a pair of handles, with or without a wheel, and is useful for carrying litter, leaves, &c. The Water Barrow, instead of a box, contains a barrel, tub, or cistern, in which fluid manure, or ordinary water, is conveyed to different parts of the garden. The Hand-barrow is a frame of wood, carried by two levers, which form four handles; for removing large pots or tubs of trees or shrubs it is very useful.

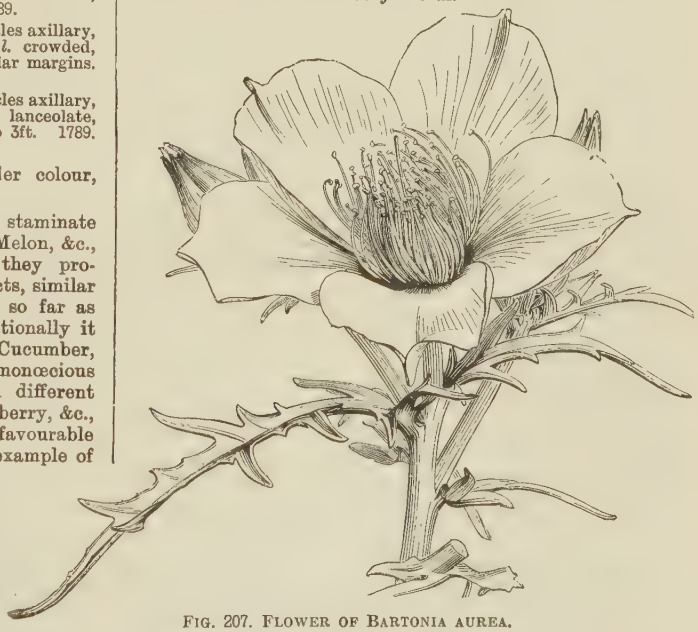


FIG. 207. FLOWER OF BARTONIA AUREA.

BARTLINGIA. A synonym of **Plocama** (which *see*).

BARTONIA (in honour of Benjamin S. Barton, M.D., formerly Professor of Botany at Philadelphia). ORD. *Loasaceæ*. Hardy annuals or biennials, downy, with stiff and bearded hairs. This genus is now placed under *Mentzelia* in most standard botanical works. Flowers white or yellow, large, terminal, expanding in the evening, when they are very fragrant, and becoming reddish as they fade. Leaves alternate, interruptedly pinnatifid. The species are very showy, and well worth growing. Any ordinary garden soil suits them. Seeds should be raised in a gentle heat in spring;

Bartonia—*continued.*

and, when the seedlings are sufficiently large, they should be potted singly into small, well-drained pots. In winter, they should be placed on a dry shelf in a greenhouse or frame. *B. aurea* is one of the brightest of hardy annuals, and may be sown either in a frame, or in the open border in April.

B. albescens (whitish).* *fl.*, petals ten, pale yellow, disposed in a leafy panicle. July. *l.* sinuately toothed. Stem with a white shining epidermis. *h.* 1ft. to 4ft. Chili, 1831. Annual or biennial. (S. B. F. G. ii., 182.)

B. aurea (golden).* *fl.* two or three together, terminal, bright golden yellow, as large as a half-crown; petals five. June. *h.* 1ft. California, 1834. Annual. See Fig. 207. (B. M. 3649.)

B. nuda (naked) and **B. ornata** (adorned) are two very pretty white-flowered biennial species. *h.* 2ft. Missouri, 1811.

BARYOSMA. *See* **Barosma.**

BASAL, or **BASILAR.** Situated at the base of anything; as the embryo, when situated at the bottom of the seed.

BASELLA (its Malabar name). Malabar Nightshade. ORD. *Basellaceæ.* Annual or biennial stove trailers, with white or pinkish flowers, of no great horticultural value. In India, and elsewhere throughout the tropics, some of the species are cultivated as pot herbs, and are used as a substitute for Spinach.

B. alba (white).* *fl.* white. August. *l.* heart-shaped, pointed. *h.* 8in. India, 1688. This plant, either when allowed to fall in festoons from the roof of a warm house, or treated as a basket plant, forms an elegant object when in flower.

BASELLACEÆ. A series of usually herbaceous climbers, and considered a tribe of *Chenopodiaceæ.*

BASIL, SWEET (*Ocimum Basilicum*). This is a tender annual from India, and must be raised in gentle heat. The foliage is somewhat largely used for flavouring purposes. Seeds should be sown in April, the seedlings pricked out into boxes to strengthen, and finally planted out about 8in. asunder, in beds of light rich soil, in June, being well watered until fully established. As soon as they bloom, they should be cut down to within a few inches of the ground, and the portions cut off should be tied up in small bunches and dried in the shade for winter use. Some of the plants can be lifted in September, potted up, and placed in a warm greenhouse for the winter, when the fresh green leaves will be found very useful. Bush Basil (*Ocymum minimum*) is a dwarfer plant, but may be treated in the same way. Wild Basil is botanically known as *Calamintha Clinopodium.*

BASIL-THYME. *See* **Calamintha Acinos.**

BASI-NERVED. When the nerves of a leaf spring from the base.

BASING-UP. The raising of a small bank of earth entirely round a plant, so as to retain water immediately about the root. The term is sometimes used to signify **Earthing** or **Moulding,** which *see.*

BASKETS. Few objects contribute more to the adornment of a window, or the decoration of the dining-room, drawing-room, or glass-house, than Hanging Baskets, tastefully filled with handsome foliaged and flowering plants. Baskets are made in different forms and of various materials, such as wire, terra-cotta, wood, and cork. The Wire Baskets have a very light and elegant appearance, and are generally used. In filling Baskets, the inside should be lined with a thick layer of moss, or *Selaginella Kraussiana*, next to which a layer of coarse sacking must be placed, to prevent the soil from working through. Terra-cotta Baskets are very pretty, and are extensively employed in domestic rooms, but they should always have one or more holes at the bottom, to facilitate drainage. Rustic Baskets, of cork or wood, are also very suitable for floral arrangements; those composed of teak-wood are very generally used for orchids. The compost should be prepared according to the requirements of the plant or plants intended to be grown, which can be easily ascertained on reference to such plants

Baskets—*continued.*

in this work. The soil should not be allowed to get dry; in the event of this happening, however, a thorough soaking by immersion must be given. As a rule, attention should be given in the matter of watering every other day, and light syringing every morning and evening during the spring and summer months will be most beneficial. The Baskets should be examined every week, all dead or decaying leaves being removed, and any insects, which are so likely to get a foothold, destroyed. In arranging the subjects, the centre plant should be the tallest, the next outer ones shorter, and the marginal ones of a trailing or drooping habit, so that the whole may present a symmetrical, and at the same time a natural, appearance. Wickerwork Baskets are used for carrying or transferring plants, and are generally made 18in. wide by 20in. deep; they are extremely useful, and should be in every garden. Split wood and withes are largely employed in making Baskets. The Planter's Basket, described by Loudon as a flat, rectangular utensil of wickerwork or boards, partitioned into three or more parts, for the purpose of carrying with the gardener when about to plant or remove plants, is now, unfortunately, almost obsolete. One division is for the plants, another for those taken up, and a third for the tools to be made use of, and for any decayed parts of plants, stones, weeds, or other refuse which may be collected. By using this Basket, order, accuracy, and neatness are secured. The Sussex "Truck" Baskets, made of willow-wood, are very useful, being both light and durable. *See also* **Measures.**

BASSIA (named after Ferdinando Bassi, Curator of the Botanic Garden at Bologna). ORD. *Sapotaceæ.* Handsome lofty-growing lactescent stove trees, with axillary, solitary, or aggregate flowers, and quite entire, smooth, coriaceous leaves. They require stove heat, and a compost of peat and loam. Cuttings, taken from ripened wood, strike readily in sand, under a hand glass, in a strong moist heat.

B. butyracea (buttery). The Indian Butter Tree. *fl.*, pedicels aggregate, and are, as well as the calyces, woolly. *l.* obovate, 8in. to 9in. long, and 4in. to 5in. broad, tomentose beneath. *h.* 30ft. to 70ft. Nepaul, 1823. (B. F. F. 35.)

B. latifolia (broad-leaved). The Mahwah Tree of Bengal. *fl.*, corolla thick and fleshy; pedicels drooping, terminal. *l.* oblong or elliptic, smooth above, whitish beneath, 4in. to 8in. long, and 2in. to 4in. broad. *h.* 50ft. India, 1799. (B. F. S. 41.)

B. longifolia (long-leaved). *fl.*, pedicels axillary, drooping, crowded round the ends of the branchlets. *l.* ovate-lanceolate, approximate at the tops of the branches, 6in. long, deciduous. *h.* 50ft. Malabar, 1811. (B. F. S. 42.)

BASS or **BAST MATS.** These are prepared, chiefly in Russia, from the inner bark of various Limes (*Tilia*), and are very largely used in this country by nurserymen for packing purposes. They are also extensively employed as coverings, being excellent preventatives of the effects of frost. They are beneficial as a covering for beds of early vegetables, to prevent radiation during the night. For tying purposes they are now greatly superseded by Raffia Grass. Archangel Mats are larger, and of better quality than the St. Petersburg. Dunnage Mats are heavy, and generally used for covering, as they are much cheaper.

BASTARD ACACIA. *See* **Robinia Pseudo-acacia.**

BASTARD BALM. *See* **Melittis.**

BASTARD BOX. *See* **Polygala chamæbuxus.**

BASTARD CABBAGE-TREE. *See* **Geoffræa.**

BASTARD CHERRY. *See* **Cerasus Pseudocerasus.**

BASTARD CINNAMON. *See* **Cinnamomum Cassia.**

BASTARD CORK TREE. *See* **Quercus pseudosuber.**

BASTARD INDIGO. *See* **Amorpha.**

BASTARD LUPINE. *See* **Trifolium Lupinaster.**

BASTARD QUINCE. *See* **Pyrus Chamæmespilus.**

BASTARD VERVAIN. *See* **Stachytarpheta.**

BASTARD VETCH. *See* **Phaca.**

BASTARD WIND-FLOWER. *See* **Gentiana Pseudo-pneumonanthe.**

BASTARD WOOD-SAGE. *See* **Teucrium Pseudo-scorodonia.**

BAST MATS. *See* **Bass Mats.**

BATATAS (its aboriginal name). ORD. *Convolvulaceæ.* This genus is now referred to *Ipomœa.* Strong, free-growing, greenhouse or stove deciduous twiners. Calyx of five sepals; corolla campanulate; stamens inclosed. They are of easy culture, only requiring plenty of room to spread, and are well adapted for trellis work, or to run up pillars. They are all tuberous rooted, and therefore require to be kept dry when in a dormant state. A rich, open, loamy soil is most suitable. Young cuttings strike readily under a hand glass, in heat.

B. bignonioides (Bignonia-like).* *fl.*, corolla dark purple, funnel-shaped, with a curled limb; peduncles many-flowered, nutant, shorter than the petioles. July. *l.* three-lobed; lobes rounded, imbricate. Cayenne, 1824. (B. M. 2645.)

B. Cavanillesii (Cavanilles').* *fl.* pale whitish-red; lobes of corolla obtuse, crenulated; peduncles one to three-flowered. August. *l.* quinate; leaflets ovate, entire, unequal. Native country unknown, 1815.

FIG. 208. BATATAS EDULIS, showing Tuber.

B. edulis (edible).* Sweet Potato. *fl.*, corolla 1in. long, white outside and purple inside; peduncles equal in length to the petioles, or exceeding them, three to four-flowered. *l.* variable, usually angular, also lobed. Stem creeping, rarely climbing. East Indies, 1797. See Fig. 208.

B. glaucifolia (milky-green-leaved). *fl.*, corolla small, purplish, with an inflated tube, and ovate, acute segments; peduncles two-flowered, length of leaves. May. *l.* sagittate, truncate behind, on long petioles. Mexico, 1732.

B. heterophylla (various-leaved). *fl.* blue; peduncles solitary, axillary, bearing each three sessile flowers. July. *l.* quinately palmate; lobes or leaflets ovate-spathulate, acute. Plant very villous. Cuba, 1817.

B. paniculata (panicled).* *fl.* large, purple; peduncles much exceeding the petioles, many-flowered, dichotomously and corymbosely panicled. June. *l.* palmate, five to seven-cleft; lobes ovate-lanceolate or elliptic, bluntish, rarely sub-acuminated. India, 1799. (G. C. n. s., x., 341.)

Batatas—*continued.*

B. senegalensis (Senegalese). *fl.* white or purplish, large; peduncles three-flowered. June. *l.* quinately palmate; lobes ovate, obtuse, middle one the largest. Stem white, tubercular. Guinea, 1823.

B. venosa (veiny). *fl.* purple; peduncles umbellate, with an ovate-cordate, solitary leaf at the base of each pedicel. July. *l.* digitately quinate; leaflets petiolate, acuminated, quite entire. France, 1820.

BATEMANNIA (named after Mr. J. Bateman, a collector and cultivator of Orchids, and author of a "Monograph of Odontoglossum," and other works on orchidaceous plants). ORD. *Orchideæ.* A small and easily-grown genus of dwarf, compact-growing epiphytes, closely allied to *Maxillaria*, but differing from that genus in having the anther-bed with a membranous border. They may be grown in pots, in a compost of peat and moss, or on blocks of wood with moss. They require an intermediate house and plenty of water in the growing season. Propagated by divisions and offsets. They have generally a free-flowering habit; but some of the species are not so ornamental as many other Orchids.

B. armillata (braceleted). *fl.* green, white. 1875. (R. X. O. 316.)

B. Burtii (Burt's). *fl.* red-brown, yellow base, 3in. across; lip white, tipped chocolate. Autumn. *l.* elliptic-oblong, or ligulate, sub-distichous. Plant bulbless. Costa Rica, 1872. (B. M. 6003.)

B. Colleyi (Colley's). *fl.* on a pendulous raceme, rising from the base of the pseudo-bulbs; sepals and petals brownish-purple within, green without; lip white. Autumn. *h.* 6in. Demerara, 1834. (B. R. 1714.)

B. grandiflora (large-flowered).* *fl.*, flower-spike coming up with the young growth, bearing three or four flowers, of curious structure; sepals and petals olive-green, striped with reddish-brown; lip white, with reddish-purple streaks, orange or yellow towards the base. Pseudo-bulbs ovate, 3in. or 4in. long, and bearing two large, broad, leathery leaves. New Grenada, 1866. (B. M. 5567.)

B. Wallisii (Wallis').* *fl.*, sepals light greenish-yellow outside, olive-green to chestnut-brown inside, with some yellow at the base; petals with scarlet stripes at the very base, but otherwise coloured like the sepals; lip blade greenish, with a brownish hue at the anterior part; peduncles slender, corymbose. *h.* 1ft. Columbia, 1876.

BATSCHIA. *See* **Lithospermum.**

BAUERA (named after Francis and Ferdinand Bauer, German botanical draughtsmen). ORD. *Saxifragsœ.* Small shrubs, natives of Australia, New Zealand, &c. Flowers axillary, solitary, pedunculate. Leaves six in a whorl, approximating by threes, and therefore, as it were, opposite and ternate, exstipulate. Easily cultivated in a compost of sandy loam and peat. Propagated by cuttings, placed in sandy soil, under a glass. These very pretty little greenhouse evergreens flower nearly the whole year through.

B. humilis (low). *fl.*, corolla red, one-half smaller than *B. rubioides*, and the plant is altogether much smaller. July to December. *l.* oblong, crenated. *h.* 1ft. New South Wales, 1804. (L. B. C. 1197.)

B. rubiæfolia (Madder-leaved). Synonymous with *B. rubioides.*

B. rubioides (Madder-like).* *fl.* pale red, or pink. *l.* lanceolate, crenated. *h.* 1ft. to 2ft. New South Wales, 1793. SYN. *B. rubiæfolia.* (A. B. R. 198.)

BAUHINIA (in honour of John and Caspar Bauhin, two famous botanists of the sixteenth century). Mountain Ebony. ORD. *Leguminosœ.* Very showy stove evergreen shrubs. Flowers racemose; petals five, spreading, oblong, rather unequal, upper one usually distant from the rest. Leaves two-lobed, constantly composed of two jointed leaflets at the top of the petiole, sometimes nearly free, but usually joined together, more or less, and with an awn in the recess. They succeed well in a mixture of sand, loam, and peat, requiring good drainage and moderately firm potting. Propagated by cuttings, which should be taken when the wood is neither very ripe nor very young; the leaves must be dressed off, and the cuttings planted in sand, under a glass, in moist heat. Although glorious objects in the tropics, few of the species flower under our comparatively sunless skies; those which hitherto have succeeded well in Britain are marked with an asterisk.

Bauhinia—*continued.*

B. acuminata (taper-pointed-leaved). *fl.* pure white; petals broadly ovate, hardly stipitate. June. *l.* rather cordate at the base, smoothish; leaflets connected beyond the middle, ovate, acuminated, parallel, four-nerved. *h.* 5ft. to 6ft. Malabar, 1808.

B. aurita (eared). *fl.* white; petals ovate, on short stipes. August. *l.* glabrous, cordate at the base; leaflets connected the fourth part of their length, oblong-lanceolate, nearly parallel, six to eight-nerved. *h.* 4ft. to 6ft. Jamaica, 1756.

B. corymbosa (corymbose).* *fl.* in loose racemes; petals pinkish, regular, crenulated at the edge. Summer. *l.*, leaflets semi-oval, obtuse, parallel, connected nearly to the middle, three-nerved, cordate at the base, the nerves on the under surface, as well as the petioles, branches, and calyces, clothed with rufous villi. Shrubby climber. India, 1818. (G. C. 1881, xvi., p. 204.)

B. inermis (unarmed). *fl.* white; petals linear; racemes terminal, leafless, simple. *l.* ovate at the base, ferruginous beneath; leaflets oblong, acute, four-nerved, parallel, connected a little beyond the middle. *h.* 6ft. to 8ft. Mexico, 1810.

B. multinerva (many-nerved). *fl.* snow-white; petals linear. Legume 8in. to 12in. long. *l.* elliptic, rounded at the base, membranous, shining above, rather pilose beneath; nerves ferruginous; leaflets semi-ovate, obtuse, approximate, five-nerved; free. *h.* 20ft. Caraccas, 1817.

B. natalensis (Natal).* *fl.* white, 1½in. across, opposite the leaves. September. *l.* small, alternate, of two obliquely-oblong rounded leaflets. Natal, 1870. (B. M. 6086.)

B. petiolata (long-petioled). *fl.* white, 3in. long, in terminal clusters. Autumn. *l.* stalked, ovate-acuminate, five-nerved, glabrous. Columbia, 1862. SYN. *Casparia speciosa.* (B. M. 6277.)

B. pubescens (downy). *fl.* white, large, much crowded; petals obovate; peduncles three to four-flowered. *l.* rather cordate at the base, pubescent beneath and on the petioles; leaflets connected beyond the middle, oval, obtuse, four-nerved, nearly parallel. *h.* 4ft. to 6ft. Jamaica, 1823.

B. purpurea (purple). *fl.*, petals red, one of them streaked with white on the claw, lanceolate, acute. Legume linear, 1ft. long. *l.* cordate at the base, coriaceous, ultimately glabrous; leaflets connected much above the middle, broadly ovate, obtuse, four-nerved; free. *h.* 6ft. India, 1778.

B. racemosa (racemose). *fl.* white; petals obovate, obtuse; raceme somewhat corymbose. *l.* cordate at the base, clothed with silky villi beneath, as well as on the peduncles, petioles, branches, calyces, and petals; leaflets broadly ovate, obtuse, connected to the middle, five-nerved. India, 1790. Shrubby climber. (B. F. S. 182.)

B. tomentosa (tomentose). *fl.*, petals pale yellow, with a red spot at the claw, obovate, obtuse; peduncles one to three-flowered. *l.* ovate or roundish at the base; under surface villous, as well as the petioles, branches, stipules, peduncles, bracts, and calyces; leaflets connected beyond the middle, oval, obtuse, three to four-nerved. *h.* 6ft. to 12ft. Ceylon, 1808.

B. variegata (variegated).* *fl.* red, marked with white, and yellow at the base, in loose terminal racemes; petals ovate, nearly sessile. June. *l.* cordate at the base, glabrous; leaflets broadly-ovate, obtuse, five-nerved, connected beyond the middle; free. *h.* 20ft. Malabar, 1690.

B. v. chinensis (Chinese). *fl.*, petals lilac, with one purple spot at the base of each, acute. *l.* rounded at the base. China.

BAWD-MONEY. *See* **Meum.**

BAY-TREE. *See* **Laurus nobilis.**

BEAK. Anything resembling the beak of a bird, as in *Aconitum*; the point which ends the helmet or upper sepal; hard, sharp points.

BEAM TREE. *See* **Pyrus Aria.**

BEAN BEETLE (*Bruchus granarius*). This insect, by depositing its eggs in the seeds of Beans and Peas, causes a great amount of injury. It is about an eighth of an inch long, black, with brown hairs and white spots; tip of the tail prolonged, downy; front pair of legs reddish. The most effectual means of prevention is to destroy, when sowing, all seeds infested by it; and this may be detected by the skin of the seed being unusually transparent above the tunnel for exit. Imported seeds of Broad Beans are often much infested. "Dipping the Beans or Peas in boiling water for one minute is stated to kill the grub inside; but, as dipping for four minutes generally destroys the germinating power, the experiment is much too hazardous for general use" (Ormerod).

BEAN CAPER. *See* **Zygophyllum.**

BEAN FLY. *See* **Aphides** and **Black Fly.**

BEANS. There are three sections of these in cultivation for garden purposes, viz.: The Dwarf or French Bean; the Climbing, or Scarlet Runner; and the ordinary Broad Bean. *See also* **Faba** and **Phaseolus.**

FIG. 209. BROAD BEAN PLANT IN FLOWER (FABA VULGARIS).

Soil. All Beans like a somewhat loamy soil, which, to secure good crops, must be deeply worked and heavily

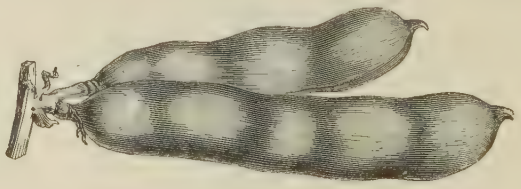


FIG. 210. PODS OF BROAD BEAN.

manured. The Kidney Beans, dwarf and tall, however, do not care for so heavy a soil as the Broad and Long-podded kinds; and this fact should be borne in mind when selecting

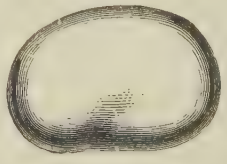


FIG. 211. BROAD BEAN SEED.

their respective situations. The term Kidney is generally applied to both the Dwarf or French and the Climbing or Scarlet Runner.

Beans—*continued.*

BROAD AND LONG-PODDED (*Faba vulgaris*). *Cultivation*: As early as possible in the autumn, deeply trench a piece of ground, and work in a heavy dressing of manure, leaving the surface of the soil in ridges, to become well aërated by winter frosts. Where desired, a piece of ground on a warm, protected border, can also be deeply dug in November, and a few rows of Mazagans sown to stand the winter. When up, draw a ridge of soil on either side the rows, and in frosty weather strew a few handfuls of bracken, or other light, dry litter, over them. Not much is, however, gained by this winter sowing. Early in January, level the ridges with a fork, working the whole of the surface soil over, and towards the end of the month, make the first sowing, choosing Mazagan and other early varieties. Mark out two rows, 9in. asunder, leave a space of 30in., then another two rows, and so on throughout the piece sown. If preferred, they may be sown in single rows at intervals of 1½ft. The drills should be about 3in. deep, and the seed from 7in. to 9in. apart in the rows. Where the double-row system is adopted, arrange the seed for the plants to come alternately. In March, get in the main sowing of the Broad and later Long-podded kinds, in the manner already described; another sowing for late use may be made in April. When the plants are about 6in. high, earth up as recommended for those sown in the autumn. As soon as a good crop is set, pinch out the tops of the plants, to assist the maturation of the Beans, and prevent the attacks of the fly. Figs. 209, 210, and 211 are excellent representations of the flowering plant, pods, and seed of the Broad Bean.

Sorts. For early use: Early Mazagan, Long-pod, Marshall's Early Prolific, and Seville Long-pod. For late use: Carter's Mammoth Long-pod, and Broad Windsor (white variety). These are all distinct and good varieties.

FIG. 212. FRUITING PLANT OF DWARF OR FRENCH BEAN (PHASEOLUS VULGARIS).

DWARF OR FRENCH KIDNEY BEANS (*Phaseolus vulgaris*). *Cultivation*: This class (see Fig. 212) also requires a rich and deeply trenched rather light soil. A very important point is to get the ground into a good condition, by frequently forking it over; and, as the seeds are not sown till the beginning of May, there is plenty of time for the work. The finer the soil is, and the more it is aërated, the better will it suit the crop. From the beginning of May till the end of June, at intervals, draw out drills about 2ft. apart, and 3in. deep, and in these place the Beans tolerably thick, as generally they are not all certain to grow. As soon as up, carefully thin them, and slightly earth up to prevent the wind blowing them about. They

Beans—*continued.*

should not, however, be earthed higher than the seed leaves, or they will probably rot off in wet weather. Keep free from weeds, and maintain a sharp look out for slugs. In dry weather, water occasionally, giving good drenchings, and not mere sprinklings, which do more harm than good. A good mulching of half-rotted manure is very beneficial, as it prevents evaporation to a great extent, besides affording some amount of nourishment to the plants. Great care must be taken to pick off the Beans as soon as large enough for use, or they will exhaust the plants. Where seeds are needed, a number of plants should be left for the purpose, and these should be some of the best, to prevent deterioration, or loss of the true variety.

Forcing. French Beans require more heat than can be obtained in either a frame or an ordinary greenhouse; and, although easy enough to grow in a structure suited to their requirements, yet, if such does not exist, they are almost sure to fail. A good heat, from 60deg. to 70deg., with abundance of moisture, is necessary for successful results. Plenty of light is also most essential. A position such as that of a cucumber house is generally a suitable one; but the plants must not be placed under the cucumbers. Successional sowings in pots or boxes must be made, from the end of August till March, to keep up a supply. For soil, use good maiden loam, with a little well-rotted manure added. Use 8in. pots, sowing five or six beans in each. The first sowing should be placed in a frame and kept well watered, bringing into heat in October; but the subsequent sowings should be placed directly in the house. Keep the soil moist, and the plants free from aphides and other insect pests, and give air at every favourable opportunity. The plants should be as near the light as possible, and kept from falling about by tying or placing small pieces of Birch wood round them. In dull weather, it will be found that the blossoms will not set so freely as when the sun shines brightly; therefore, every care should be taken to secure both heat and ventilation when sunshine prevails. When the pots get full of roots, and the plants are bearing fruit freely, a little liquid manure is of great assistance; at no time must the plants get dry enough to flag. Allow plenty of room for the full development of foliage, and maintain a minimum temperature of 60deg., with plenty of moisture.

Sorts. These are very numerous, among the best being Black Negro, Canadian Wonder, Canterbury, Fulmer's Forcing, Golden Dun, Newington Wonder, Osborn's Early Forcing, Sion House, and Sir Joseph Paxton.

RUNNERS OR CLIMBING KIDNEY BEANS (*Phaseolus multiflorus*). *Cultivation*: Being tall growers, these need a greater space than the Dwarf French varieties, and they also require support. Rich soil is indispensable for them, and liberal supplies of water on light soils and in dry weather. A good overhead syringing from time to time is also advantageous. Trench and heavily manure a piece of ground in autumn, leaving it in ridges for the winter. In March, level the ridges down, and well work the ground, to render it friable and in good condition. The plants being extremely tender, it is not safe to sow before the end of April or the first week in May. It is preferable to sow in rows, which should be from 6ft. to 12ft. apart, and crop the ground between with other vegetables. Earth up and stake them as soon as ready, to prevent injury from rough wind. A good plan, which may be adopted to obtain early produce, is to raise seedlings in boxes in a cold frame, getting them ready for planting out in the middle of May. Plant at the same distances, and treat afterwards as recommended for those sown out of doors.

If preferred, they can be grown on the ground without stakes. Under this treatment, they must have their tops pinched off when about 18in. high, continuing this pinching from time to time as necessary. If this plan is adopted, the rows need only be 3ft. apart, the ground

Beans—*continued.*

not being otherwise cropped. In dry seasons and on light soils, there is an advantage attached to this method, namely, that those on sticks are liable to injury from drought, while the foliage of those pinched back keeps the soil moist underneath.

FIG. 213. RUNNER OR CLIMBING KIDNEY BEAN (PHASEOLUS MULTIFLORUS).

Runner Beans may also be planted to cover arches or fences, and in various places of a like description. See Fig. 213.

Sorts. Common Scarlet Runner, Champion, Painted Lady, and Giant White. The first two are those generally grown.

BEAN-TREE. *See* **Ceratonia Siliqua.**

BEARBERRY, and **BEAR'S GRAPE.** *See* **Arctostaphylos Uva-ursi.**

BEARD-TONGUE. *See* **Pentstemon.**

BEAR'S BREECH. *See* **Acanthus.**

BEAR'S FOOT. *See* **Helleborus fœtidus.**

BEATONIA. *See* **Tigridia.**

BEAUCARNEA (a commemorative name). ORD. *Liliaceæ.* A small genus of curious greenhouse plants, natives of Mexico. Leaves narrow, gracefully depending. Stems slender, and woody, with a peculiar swollen, somewhat napiform base. Mr. B. S. Williams recommends that these plants be potted in rich fibrous loam and sand, with ample drainage, and, during the growing season, liberally supplied with water. Propagated by cuttings, when obtainable; but chiefly by seeds, which have to be imported from their native country. Beaucarneas are principally grown for the beauty of their foliage, and are grotesque, graceful, and extremely curious in habit and form.

B. glauca (grey).* *l.* pendent, glaucous, 2ft. to 3ft. long. Stem slender, the swollen base becoming woody with age.

B. g. latifolia (broad-leaved) differs from the type only in its stouter and more robust stem and broader leaves.

B. longifolia (long-leaved).* *l.* 6ft. to 10ft. long, narrow, pendent, dark green, forming a beautiful vase-like centre. *h.* 10ft. Mexico, 1868. Very distinct. (G. C. 1877, vii., 493.)

Beaucarnea—*continued.*

B. recurvata (recurved-leaved).* *l.* very long, linear, gracefully pendulous, bright green. Mexico, about 1845. This is an excellent subject for open-air culture during the summer, as well as for the conservatory. SYN. *Pincenictitia tuberculata.* (G. C. 1870, 1445.)

B. r. rubra (red). *l.* red at base.

B. stricta (upright). *l.* 3ft. or more long, less than 1in. broad, very glaucous. Stem stout. Mexico, 1870.

BEAUFORTIA (commemorative of Mary, Duchess of Beaufort, a botanical patroness). Including *Schizopleura.* ORD. *Myrtaceæ.* Elegant free-flowering greenhouse Australian shrubs. Flowers scarlet; calyx with a turbinate tube; stamens in bundles opposite the petals. Leaves sessile, opposite or scattered. Beaufortias require a compost of peat, leaf soil, and loam, lightened, if necessary, by the addition of sand. Cuttings of half-ripened shoots root freely in sandy soil, under a glass, with very little heat.

B. decussata (decussate). *fl.* scarlet; bundles of stamens on very long claws; filaments radiating. May. *l.* opposite, decussate, ovate, or oval, many-nerved. *h.* 3ft. to 10ft. New Holland, 1803. (B. M. 1733.)

B. purpurea (purple).* *fl.* purplish-red, in dense globular heads. *l.* three to five-nerved, erect or spreading, ovate-lanceolate to lanceolate-linear. New Holland.

B. sparsa (few-leaved). *fl.* bright scarlet. *l.* many-nerved, scattered, ovate-elliptical, obtuse. West Australia. SYN. *B. splendens.* (P. F. G. xiii., 145.)

B. splendens (splendid). Synonymous with *B. sparsa.*

BEAUMONTIA (in honour of Mrs. Beaumont, formerly of Bretton Hall, Yorkshire). ORD. *Apocynaceæ.* A very ornamental stove twiner, remarkable for its handsome flowers. It succeeds best when planted out in the borders of a temperate house, in rich lumpy loam and peat. Propagated by cuttings, placed in sand, with bottom heat.

B. grandiflora (large-flowered).* *fl.*, corolla large, white, greenish outside near the base, and dark throat, with a short tube, and a large campanulate five-lobed limb; corymbs axillary and terminal, many-flowered. June. *l.* opposite, broad, oblong-ovate, with a little point, tapering towards the base, smooth and shining above, but rather downy beneath; young leaves and branches rusty. Chittagong and Sylhet, 1820. (B. M. 3213.)

BED. A term usually applied to pieces of ground laid out in gardens for sowing small seeds, or for the isolation and better protection of small collections of plants in the reserve ground. The oblong is the best shape for this purpose, about 4ft. or 5ft. wide, somewhat raised, and having a narrow path on each side, so that the workman may attend to the plants or seeds without having to tread on the bed. Any one part of a flower-garden design, cut out in grass, or otherwise formed, is also generally termed a Bed. When required to be planted for effect, as in this case, the Bed should be proportionate in size to the plants that are to be put in it, always planting the highest in the centre and gradually sloping, with other sizes, to the edges, which should be the lowest. Circular Beds are best with one centre plant; and oblong or other shapes should have the height of the centre plants carried nearly the whole length, not, however, placing them in too formal a manner.

BEDDING-IN. A method of seed-sowing, now almost obsolete, and chiefly employed in nurseries. "In this method, the ground being dug and formed by alleys into Beds, 4ft. or 5ft. wide, each alley being a spade's width or more between Bed and Bed, and the earth being drawn off the top of the Bed with a rake or spade, ½in. or 1in. deep into the alleys, the seed is then sown all over the surface of the Bed; which being done, the earth in the alleys is immediately cast over the Bed, again covering the seeds the same depth, and the surface is raked smooth" (Johnson). In the case of small seeds, a very light covering is needed, and that only of very fine soil.

BEDDING-OUT. The temporary placing out of doors of greenhouse and other tender plants during the summer months. It is considered by some to be the showiest, most expensive, and most unnatural of any style. The geometrical arrangement of gaudy colours is not at all times satisfactory, and under the most favourable con-

Bedding-out—*continued.*

ditions the design is rarely retained more than two or three months, say, from July to September. The method is, however, so extensively adopted as to demand due notice in this work. Bedding usually commences in May. An important consideration is the proper preparation of the soil for the reception of the plants. It will be found to materially

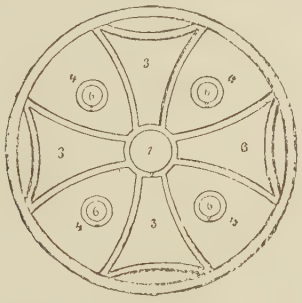


FIG. 214. DESIGN FOR CARPET BEDDING.

assist the growth if the soil is well dug over a fortnight before the plants are put in. By this means, it will acquire a certain amount of solidity, a point of great importance with fibrous-rooted plants that are subject to injury from the fine roots not taking a firm hold of the soil. Having

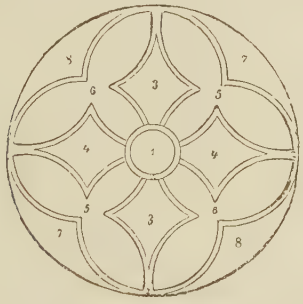


FIG. 215. DESIGN FOR CARPET BEDDING.

decided upon the arrangement of the plants, proceed to work with the planting. With round, oval, or, indeed, almost any shaped bed, begin in the centre and work towards the edge; in borders, commence at the back and finish with the front row. Plant with a trowel, disturbing the balls as little as possible, and when in the holes press the soil moderately firm. After the Bed is finished, give a good soaking of water to settle the soil at the roots. Manure for Flower-beds should always be perfectly rotten, such as that from a spent hotbed. When the plants are thoroughly established, water must only be given if they show signs

Bedding-out—*continued.*

of distress; and then a good soaking should be applied. A careful hoeing of the surface after planting will be most beneficial, leaving it smooth and tidy. A Dutch hoe will be the best to use. Injudicious use of manure and water will only cause a foliaceous growth. The proper treatment of the various Bedding Plants will be found under their respective headings. For spring decoration, the Beds may be filled with Dutch bulbs, and spring-flowering annuals and perennials *ad infinitum*; or, after the plants are removed in autumn, the Beds may be filled with evergreens plunged in pots, such as Aucuba, Arbor vitæ, Euonymus, and various little Conifers, which have a bright appearance through the winter, and can be removed at any time. With the relative value, or advisability of adoption, of either or any system of gardening, it scarcely comes within the province of this work to deal. No hard-and-fast rules can be laid down as regards "style," and each individual may follow his own taste and inclination.

Carpet Bedding. This mode of gardening, although not so generally employed as it was some few years ago, has many admirers, and small plots, geometrically arranged in multi-coloured beds on lawns, are frequently seen. In our large public parks, the system is largely adopted, and evidently proves very gratifying to the multitudes who visit these places; but probably no system is more unnatural or expensive, as such a large number of plants are necessary in order to produce a desirable effect. The illustrations (Figs. 214 and 215) represent two designs for Carpet Beds. The numbers placed in the various compartments indicate the way the different colours should be arranged, repeats being marked by the same cypher. A very varied and large selection of plants can be used for Carpet Bedding, some of which are quite hardy, such as *Herniaria glabra* and *Veronica repens*, two of the best dwarf green plants; *Sempervivum californicum, Sedum lydium, S. glaucum, Antennaria tomentosa*, &c. These may be planted early in the season, with Golden Feather, and are especially valuable, as they are generally employed to a great extent. Other plants, not quite so hardy, are *Mentha Pulegium gibraltarica* and *Echeveria secunda glauca*, both of which are extensively used; while the tenderest subjects are Alternantheras of various kinds, *Coleus Verschaffeltii* and *Mesembryanthemum cordifolium variegatum*. These latter should not be planted till the first or second week in June. As the plants are usually small, and require to be planted thickly, the work is best accomplished with the fingers, pressing the soil moderately firm. First of all, work out the design, and plant the leading lines; afterwards fill in the "panels."

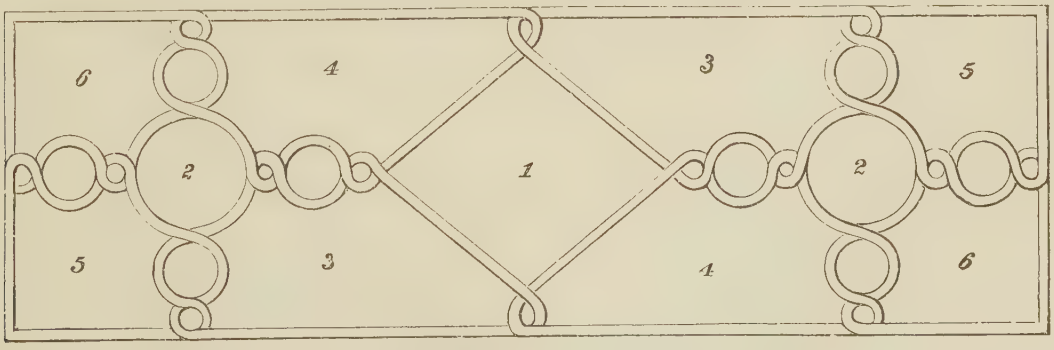


FIG. 216. DESIGN FOR BEDDING.

Sub-Tropical Bedding. This term is applied to the arrangement of tropical plants in Beds or groups outside for the summer months, and if discriminately adopted a very attractive and unique display may be made, depending greatly upon position, and mainly upon the material at command. If a sheltered and partially shady situation is

Bedding-out—*continued.*

enjoyed, a grand effect may be produced by the grouping of tree and other large ferns with palms, Cannas, Aralias, Dracænas, &c., avoiding, of course, formal arrangement, and yet, when finished, a symmetrical appearance should be produced. In more open positions, palms, Castor Oil Plants, Cannas, *Humea elegans*, Aralias, Phormiums, Wigandias,

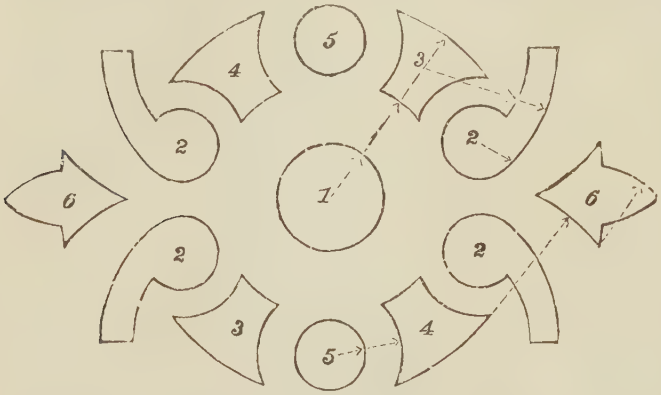


FIG. 217. DESIGN FOR BEDDING.

Nicotianas, &c., may be employed, the result being, if properly arranged, most gratifying. Sub-Tropical Bedding should not be done till the middle or end of June, and the Beds should be well dug and freely manured for those that are to be planted out.

Bedding-out—*continued.*

are intended for specimen foliage and other plants, such as Fuchsias, Yuccas, Aloes, Cannas, Solanums, variegated or plain Reeds, Grasses, Maize (*Zea*), &c. No. 1, tall plants of *Echeveria metallica*, edged with *E. glauca*; 2, 2, yellow or orange Calceolaria; 3, 3, Mrs. Leavers Pelargonium; 4, 4, Triomphe de Stella ditto; 5, 5, purple or blue Verbena; 6, 6, white ditto. The narrow border round the side may then be filled in with Golden-feather Pyrethrum, blue Lobelia, or *Alternanthera amabilis*. This same plan may also be treated in quite a different manner, according to the taste of those adopting it, or the stock of plants at command.

Fig. 217 illustrates a design admirably adapted for a rosery or small flower garden. Its only fault is the number of sharp angles at the corners of some of the Beds; but this can be counteracted by the predominance of curved lines. It is easily formed, and the effect is good if furnished in the following manner: The circle in the centre, 1, *Centaurea ragusina compacta*, edged with a double line of *Coleus Verschaffeltii*; the four figures 2, 2, 2, 2, scarlet Pelargoniums, such as Vesuvius, Bonfire, Triomphe de Stella, or others; 3, 3, Mrs. Pollock, golden-zoned Pelargoniums, edged with *Alternanthera amœna*; 4, 4, Lady Cullum, ditto, ditto, edged with ditto; 5, 5, *Lobelia speciosa*, Imperial Dwarf Ageratum, or Purple King Verbena; 6, 6, white Verbena or white Ivy-leaved Pelargonium.

The group of Beds illustrated in Fig. 218 is effective on grass or gravel. If on the latter, the lines should be

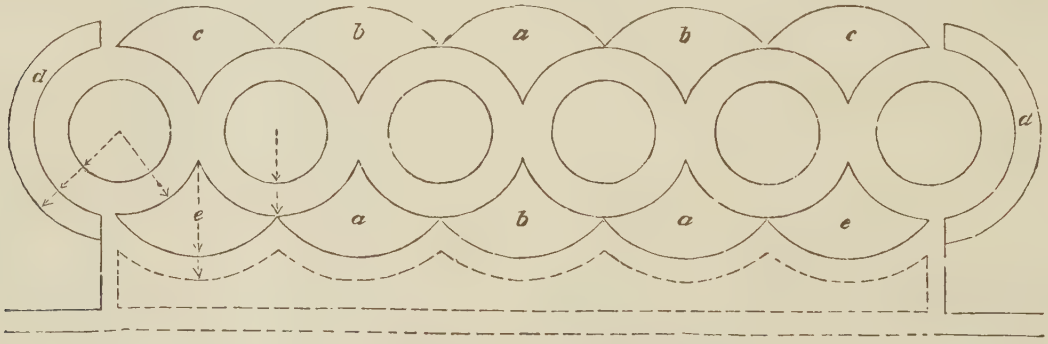


FIG. 218. DESIGN FOR BEDDING OR CARPET BEDDING.

Fig. 216 represents a Border or long piece of ground, which may be either marked out permanently with Box

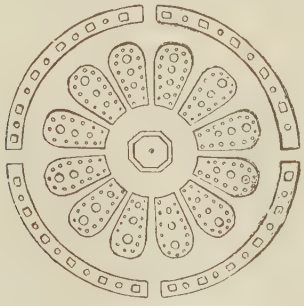


FIG. 219. ARRANGEMENT OF NURSERY FOR ROSE TREES AND SHRUBS.

edging, dwarf-growing silver or golden leaved plants, tiles, stones, or pebbles, and filled in with silver sand or bright-coloured stones or gravel; or the lines may be widened out into walks. The whole of the small circles not numbered

defined with Box, Golden Thyme, Cerastium, or Santolinas. The design is pretty on level, but is still more effective on sloping, ground; in the latter case, it should rise from the straight walk (dotted line). Thus each Bed may

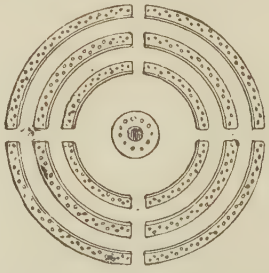
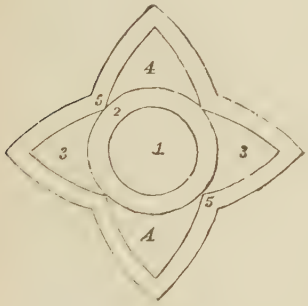


FIG. 220. ARRANGEMENT OF NURSERY FOR ROSE TREES AND SHRUBS.

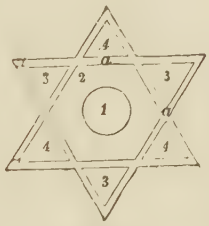
be seen to the best advantage, and the group may be extended to any length. The circular Beds should be planted with two distinct colours, such as good pink and scarlet Pelargoniums of similar habits of growth, placing

Bedding-out—*continued.*

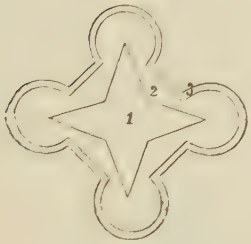
the colours in alternate Beds. The Beds, *a*, *a*, *a*, Flower of Spring, or another silver-leaved Pelargonium; *b*, *b*, *b*, Purple King Verbena, or Imperial Dwarf Ageratum; *c*, *c*, White Perfection Verbena, and silver-leaved or white-flowered Ivy-leaved Pelargonium; *d*, *d*, *Alternanthera magnifica*; *e*, *e*, Blue Lobelia. The long border, *Alternanthera paronychioides*, edged with *Antennaria tomentosa*; or *Iresine Lindenii*, edged with Pyrethrum, Golden Fleece or Crystal Palace Gem Pelargonium. The two sides may also be planted alike. The colours are reversed above to produce a greater variety and a more striking effect. This design is also well adapted for Carpet Bedding.



BED A.



BED B.

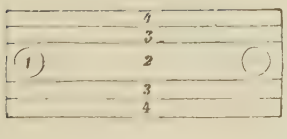


BED C.

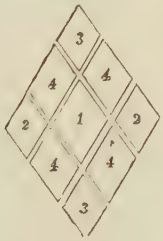
BED D.

BED E.

BED F



BED G.



BED H.

FIG. 221. BEDDING-OUT DESIGNS.

Nursery Bed. This is merely a reserve ground or nursery for a large stock of plants of various sorts, such as

Bedding-out—*continued.*

Roses, &c. One of the first requirements is an easy access to the individual plants, and with the least possible waste of space. This may be obtained by arranging the Beds in regular geometric figures, as shown in Figs. 219 and 220, and, by exercising a little care and taste, the whole can be so contrived as to present an ornamental appearance.

We are indebted to Messrs. Cannell and Sons for the diagrams of Bedding-out designs shown at Fig. 221, which may be made very effective:

Bed A. This Bed may be planted with the following: Summer-flowering: 1, Gain's Yellow Calceolaria or Ageratum Lady Jane; 2, Geranium Vesuvius or another scarlet; 3 and 4, Viola Bluebell or Purple King Verbena; 5, edged with *Gnaphalium lanatum*, or *Antennaria tomentosa*, white foliaged plants. Summer Foliage: 1, *Coleus Verschaffeltii*; 2, *Centaurea ragusina compacta*; 3 and 4, Mrs. Pollock Geranium; 5, band of any of the Echeverias, or *Kleinia repens*.

Bed B. Plants mentioned for A will do for this.

Bed C. This is really intended for a Carpet Bed. 1, *Alternanthera amabilis*, with a narrow line of *amœna* for the edge; 2, *Mentha*, or *Herniaria glabra*; 3, band of *Mesembryanthemum cordifolium variegatum*. Flowering: 1, Any kind of Scarlet Geranium; 2, Golden-leaved ditto; 3, Blue Lobelia (edge). Spring: 1, White Arabis; 2, *Myosotis dissitiflora*; 3, Golden Feather.

Bed D. Summer: 1, Pink Geranium; 2, *Iresine Lindenii*; 3, Golden Feather. Carpet: 1, *Alternanthera versicolor grandis*; 2, *Mesembryanthemum cordifolium variegatum*; 3, *Alternanthera magnifica*, edged with *Sempervivum montanum*.

Bed E. 1, Scarlet Geranium; 2, Pink ditto; 3, *Lobelia speciosa*; or, 1, *Alternanthera amœna*; 2, *Mesembryanthemum cordifolium variegatum*; 3, *Echeveria secunda glauca*.

Bed F. 1, *Dracœna*, *Chamæpeuce*, or any other graceful foliage plant for the centre; 2 and 4, *Alternanthera amabilis*, the divided lines, 6, being filled with Mentha or Echeverias; 3 and 5, *Alternanthera amœna*; and the outer edge, 7, with *Sempervivum californicum*. This bed would look well if planted with any of the above-mentioned spring flowers. Spring: Bed might be raised to a mound, and lined out with hardy Sedums, or Sempervivums, placing a larger growing one in the centre; and 2, 3, 4, and 5 divisions may be filled with any spring-flowering dwarf-growing plants.

Bed G. 1. Small plant of Yucca; 2, *Coleus Verschaffeltii*; 3, *Alyssum variegatum*; 4, *Lobelia pumila magnifica*.

Bed H. 1, Golden Feather; 2, Mesembryanthemum; 3, Mentha; 4, *Alternanthera amabilis*; or 1, *Coleus Verschaffeltii*; 2, *Centaurea ragusina*; 3, Calceolaria Golden Gem; 4, Ageratum Lady Jane.

BEDDING PLANTS. This term applies to many half-hardy subjects which are planted out in beds for summer display, such as Ageratums, Calceolarias, Geraniums, Heliotropes, Lobelias, Verbenas, &c., all of which will be treated under their respective headings. They are mostly soft-wooded plants and are easily cultivated with proper means, in spring and autumn.

BEDFORDIA (named in honour of a former Duke of Bedford). ORD. *Compositæ*. Greenhouse evergreen shrubs, allied to *Cacalia*. They thrive in a mixture of sand, peat, loam, and brick rubbish, in equal proportions. Propagated by cuttings, which should be dried a little before inserting them in rough, sandy soil.

B. salicina (Willow-like). *fl.-heads* yellow, axillary and solitary, or few together. April. *l.* alternate, lanceolate, linear, glossy above, covered with white tomentum underneath. *h.* 3ft. Victoria and Tasmania, 1820. SYN. *Cacalia salicina*. (B. R. 923.)

BEDSTRAW. *See* **Galium.**

BEECH. *See* **Fagus.**

BEES. *See* **Honey Bees, Humble Bees, and Wasps.**

BEET (*Beta*, which *see*). The present varieties of Beetroot are the offspring of *Beta vulgaris*, a plant of biennial duration, and a native of the sea coasts of Southern Europe. It was cultivated in this country about 1656, but was probably long previously introduced by the ancient Romans. Beetroot is largely used as salad, more extensively on the Continent than with us, also pickled; medium sized, deeply coloured roots being the chief desideratum. Some varieties are largely grown for their highly-coloured foliage, being planted in bedding-out designs, and generally proving extremely effective.

Cultivation: For obtaining the best results, an open situation should be chosen, free from the shade of trees. The ground should be light and sandy, and, if possible, that which has been previously manured for some other crop,

FIG. 222. LONG YELLOW BEETROOT.

French beans, for instance. Trench the soil to a depth of 2ft. in the autumn, and ridge it up for the winter. As soon as dry enough to allow of working in spring, dig over the whole bed with a steel digging fork, and break the soil tolerably fine. Sow any time from the last week in April to the end of May. Prepare the drills about a foot or 15in. apart, and from 1in. to 2in. deep. The seeds grow quicker if steeped in water previous to sowing, afterwards allowing them to get dry enough to separate from each other. Sow thinly, and fill in the drills with a rake. As soon as the plants are up, hoe between the rows, and keep free from weeds. In a fortnight or three weeks after this hoeing, if the weather has been favourable, the plants will be large enough for thinning. Thin out to about 9in. apart,

Beet—*continued.*

and carefully fill up, in dull weather, any blanks that may occur. Transplanting is, however, not generally a very satisfactory method. Carefully lift the roots in autumn, before frost comes, and wring off the leaves about an inch from the crowns. Place the roots in a cool shed or house, and allow the soil on them to get quite dry, when they may be stored for winter use in dry sand, or soil, in a shed free from frost. It is preferable to keep the crowns free from soil, to prevent decay from the ends of the leaves left on them. If this be carefully done, the roots will keep till the next season's early crop is ready. In all processes connected with the growing, storing, or cooking of this vegetable, the greatest care must be taken to avoid bruising or otherwise injuring the roots, as deficiency of colour would be the result, especially in the case of the red-fleshed kinds, in some cases rendering them valueless for table use. Seed Saving: When lifting the crop in autumn, select as many of the best formed and coloured roots as required, and store them separately from the rest. In April, plant them in a spot by themselves, where there is no danger of impregnation from other varieties, and in due time good seed will ripen. If good foliaged varieties are required, the best should be selected when growing in the summer, and either be marked by some means, or have the inferior ones removed from them.

Sorts. These are somewhat numerous—almost every seedsman having a so-called "improved strain." Nutting's Dwarf Red, Chelsea, Pine Apple, Dell's Crimson and Red Castelnaudary, are the best of the crimson or red-fleshed kinds. The Egyptian Turnip-rooted is a distinct variety, with flesh of a good colour, and fine flavour; excellent for summer salads. Betterave de Bretagne is a Continental variety; the roots grow to a good size, with a distinct outer skin of a dark colour; flesh rich purple. The best of the yellow-fleshed kinds are Small Yellow and Long Yellow (see Fig. 222); but these are not grown nearly so much as the deep-coloured section; in fact, they are almost useless for garden purposes.

FIG. 223. WHITE LEAF BEETROOT.

Beetroot for Bedding Purposes: In this case, where the foliage is the main object, the seed may be sown in a reserve bed, and the plants transferred to their positions in the flower garden. If, however, a line is required in a ribbon or other border, the best plan is to sow there, and thin out the plants to equal distances. Dell's Crimson is one of the best varieties for this purpose, being very compact and of a good dark colour.

Varieties of the Leaf Beet (*Beta Cicla*), and Sea or Perennial Beet (*Beta maritima*), are sometimes, but very seldom, cultivated for the use of the leafstalks and leaves, the roots being hard and unfit for cooking purposes. They are at the best but substitutes for other vegetables—namely, the midrib for Sea-kale and the leaves

Beet—*continued.*

for Spinach. If desired, seeds may be sown in the way described for Beetroot, in April for using in autumn and winter, and in August for spring use, plants of the latter sowing being protected in severe weather. The best sorts are Red-stalked, Yellow-stalked, and White (see Fig. 223) or Silver Leaf.

BEET CARRION BEETLE (*Silpha opaca*). This destructive insect is frequently found in dead animals, but often its grub almost destroys the leaves of Beet and Mangold Wurzel crops. The grubs, which are black and shining, when full grown are from ⅓in. to ½in. long; the three segments next the head are rounded at the sides, but the other segments are sharp, and the tail segment has a sharp spine on each side. "When full-fed, the grubs bury themselves, and form cells at the depth of 3in. or 4in. below the surface of the earth, in which they turn to pupæ, and from these the Beetle has been seen to come up in about the space of a fortnight or three weeks" (Ormerod). The Beetles are flattish, and about five lines long, brown-black, with a tawny down; eyes large and oval; horns club-shaped; body somewhat oval; wing-cases very flat, turned up at the outer edge, each case having three sharp ridges running along it; tip of abdomen dull red. Any manures or methods of cultivation that would stimulate growth in the plants, so as to permit renovation of injuries, would be found useful. If farmyard manure were applied to the soil intended for Beet *in the autumn* instead of in spring, it would lessen the risk of attack to the Beets.

BEETLES (*Coleoptera*). Beetles form one of the most extensive orders of insects, there being upwards of 3000 known British species. They vary much in appearance, but a Beetle is readily recognised by its front wings, or elytra; these form a tough horny sheath or case, which lies over the real wings, and protects them when the insect is not flying. Sometimes, the elytra are very short (see Fig. 225); the mouth is fitted with jaws for cutting. The metamorphosis is complete, *i.e.*, the larva or grub

FIG. 224. COMMON GARDEN BEETLE.

is very unlike either the quiescent pupa or the perfect insect. The period that elapses before Beetles arrive at their perfect state varies from a few weeks to two or three years, but is usually rather longer than in Butterflies or Bees. Various Beetles attack growing plants and roots. Thus, *Otiorhynchus sulcatus* and *O. picipes* attack Vines,

FIG. 225. DEVIL'S COACH HORSE.

Roses, and other plants, gnawing off the bark. Some species of Beetles attack Mushrooms, while others bore into the wood of old trees, or eat leaves (*e.g.* Turnip Fly), or burrow in the leaves, or form galls on roots (Cabbage-gall Weevil). Of some kinds, the beetles are hurtful; of

Beetles—*continued.*

others, the larvæ. Many kinds, however, are beneficial, such, for instance, as the common Ground Beetle (*Carabus*, Fig. 224), and the Devil's Coach Horse (*Ocypus olens*, Fig. 225). These live upon other insects and snails. One kind of Beetle—the Ladybird (see Figs. 226 and 227)—is very beneficial in a garden, as it preys upon the aphides, or plant lice. For instructions in dealing with the noxious kinds, *see* **Asparagus Beetle, Bean Beetle, Beet, Carrion Beetle, Click Beetle, Cockchafer, Lily Beetle, Rosechafer,** and **Turnip Fly.**

FIG. 226. SEVEN-SPOTTED LADYBIRD.

FIG. 227. GRUB OF LADYBIRD. (Enlarged).

BEET or **MANGOLD FLY** (*Anthomyia betæ*). The maggots of this fly do considerable damage by feeding on the pulp of the Beet or Mangold leaves. The eggs are small, white, and oval, and are laid in small patches beneath the leaves; the maggots are about ⅛in. long, legless, cylindrical, and yellowish-white. As it is of such recent appearance in this country, specifics for its eradication are by no means numerous; but, according to Miss Ormerod, "the best treatment appears to be to nip it in the bud, where such treatment is possible, by destroying the infested plants, but generally by all means of good cultivation, or by special applications of artificial manure, to ensure a hearty growth, which may run the plants on past the power of average attacks to weaken the leafage to a serious extent."

BEFARIA (named in honour of Bejar, a Spanish botanist). ORD. *Ericaceæ*. SYN. *Bejaria*. An elegant genus of greenhouse evergreen shrubs, closely allied to *Rhododendron*. Flowers bracteate; corolla very deeply seven-cleft, spreading. Leaves racemose or corymbose, crowded, quite entire, coriaceous. They thrive in a compost of peat and loam. Propagated by cuttings, made of the young wood, and placed in sandy soil, in gentle heat.

B. æstuans (glowing).* *fl.* purple; corymbs terminal, simple; peduncles, pedicels, rachi, calyces, and branchlets clothed with clammy glandular hairs. *l.* elliptic, rather glabrous above, but downy and glaucous beneath, while young clothed with rusty tomentum. Plant much branched; branchlets sub-verticillate. *h.* 10ft. to 15ft. Peru, 1846. SYN. *Acunna oblonga*. (G. C. 1848, 119.)

B. cinnamomea (cinnamon-coloured). *fl.* purple; panicles close, terminal; peduncles woolly, hispid. *l.* slightly downy above, rusty tomentose beneath. Branches downy, hispid. *h.* 4ft. Peru, 1847.

B. coarctata (close-headed). *fl.* purple; corymbs terminal, simple; peduncles, pedicels, rachi, and calyces clothed with rusty tomentum. *l.* oblong, glabrous, glaucous beneath. Shrub much branched. *h.* 4ft. to 5ft. Peru, 1847. (G. C. 1848, 175.)

B. glauca (glaucous).* *fl.* flesh-coloured; racemes terminal and axillary; pedicels somewhat fastigiate. June. *l.* oblong, obtuse, glaucous beneath. Shrub much branched; branchlets angular. *h.* 3ft. to 6ft. South America, 1826.

B. ledifolia (Ledum-leaved).* *fl.* purple; racemes terminal; peduncles, pedicels, rachi, branchlets, and calyces clothed with clammy glandular hairs. *l.* oblong, somewhat mucronate, with revolute edges, glaucous beneath, glandular. Shrub much branched; branches purplish. *h.* 3ft. to 4ft. South America, 1847. (F. d. S. 3, 195.)

B. racemosa (racemed). *fl.* purple, disposed in racemose terminal panicles. July. *l.* ovate-lanceolate, glabrous; branchlets smooth or hispid. *h.* 3ft. to 5ft. Georgia, 1810.

BEGONIA (named after M. Begon, a French patron of botany). ORD. *Begoniaceæ*. A large genus of succulent herbs or undershrubs (a few climbers), in many of which the stem is reduced to a tuberous rhizome, whilst some are distinctly tuberous. Flowers usually showy and large, white, rose, scarlet, or yellow, unisexual; perianth segments petaloid, four to five divisions, rarely two. Stamens numerous, filaments free or united at the base. Ovary inferior, styles two to four, free, sometimes connate, stigmas branched or twisted. Fruit capsular, rarely succulent, often winged. Seeds numerous, minute. Leaves

Begonia—*continued.*

alternate, more or less unequal-sided, entire, or lobed, or toothed. Flower-stalks axillary, cymose. Distribution: Species about 350, in all tropical moist countries, especially South America and India; not known in Australia. Cultivated species (exclusive of garden hybrids and varieties) about 150. A large number of genera, or what were considered as such are now merged in Begonia—viz., *Barya*, *Baryandra*, *Casparya*, *Pritzelia*, &c. The rich colours and beautiful form of the flowers of Begonias, their prettily-marked foliage, and free-growing, free-blossoming nature, have long marked them out as favourite garden plants. Within the last twenty years a new race, characterised by a tuberous root-stock, annual herbaceous stem, and large handsome flowers, has been introduced from the Andes of South America, from which, by means of careful cross-fertilisation and selection, a large number of beautiful and almost hardy kinds have been raised. The size, substance, and rich colours of the flowers of the majority of the plants of this race of Begonias are witness to what may be done by skilful cultivation and careful cross-breeding among plants. In the same way the large-leaved, stemless section, of which *B. Rex* may be taken as the type and principal progenitor, have been improved both in the size and the coloration of their foliage, and countless forms are now in cultivation, both as garden plants and for the decoration of rooms, &c. The propagation of Begonias may be accomplished by means of seeds, which are freely produced by almost all the cultivated kinds, by cuttings, by division of the rhizomes, and—in the case of the large-leaved kinds—by leaf-cuttings. For the first of these methods it is necessary that the seeds should be well ripened before they are gathered, and kept dry until sown. Where it is desired to increase any particular kind of garden origin, seeds are useless, none of the hybrid or seedling forms perpetuating themselves through their seeds, although equally beautiful sorts may be raised from them. The characters of all true species are, however, reproduced in their seedlings. For the successful raising of Begonia seeds it is necessary to sow them on pans or pots of well-drained, light, sandy soil, which should be well watered before the seeds are sown. The seeds should not be covered with soil, or they will fail to germinate. Over the pans a pane of glass should be placed, and they should then be stood in warm house or a frame where a temperature of about 65deg. can be maintained, and shaded from sunshine. As soon as the plantlets are large enough to be safely manipulated, they should be pricked off into pans of light leaf-mould soil, in which they may remain until large enough to be placed singly in pots. Cuttings: These strike freely if planted in small pots, in sand and leaf mould, and placed on a bottom heat of 70deg. Where large quantities are required, a bed of cocoa nut-fibre in a stove or propagating frame may be used, and in this the cuttings may be planted and remain until well rooted. Leaf cuttings succeed best when laid on sand or cocoa-nut fibre, and shaded from bright sunlight. In preparing the leaves, old, well-matured ones should be selected, and incisions made with a sharp knife across the principal nerves on the underside. They should then be placed on the sand or fibre and held down by means of a few pieces of crock. Under this treatment, bulbils will form on the lower ends of the nerves of each section of the leaf, and these, when large enough, may be removed from the bed and potted. With the exception of *B. Evansiana* (*discolor*), an almost hardy species from North China, all the shrubby species require a warm or intermediate house for their cultivation, although during the summer months a frame or sheltered bed answers for most of them, provided they are removed into their warm winter quarters on the approach of cold weather. Some of the species, such as *B. Dregei*, *B. semperflorens*, *B. nitida*, *B. fuchsioides*, *B. Lindleyana*, *B. Richardsiana*, along with the hybrids *Ascotensis*, *Knowsleyana*, *Weltoniensis*, and *Ingramii*, are grown in pots out of doors all the summer,

Begonia—*continued.*

and under liberal treatment they form large handsome specimens, which are of great value as flowering plants for the conservatory in winter. The tuberous-rooted herbaceous kinds should be started in heat in February, and, when vigorous growth has commenced, be gradually hardened off, for use either as bedding plants or as pot specimens for flowering in the greenhouse. A mixture of loam and leaf mould with a little sand and rotten cowdung is suitable for the cultivation of these plants in pots. Liberal supplies of water should be given during the growing season. As the growth decays, water should be withheld until finally the tubers may be shaken out of the soil and placed in dry sand or cocoa-nut fibre, in a house or shed where a temperature above freezing can be maintained. *B. gracilis* and its varieties, *diversifolia* and *Martiana*, are beautiful greenhouse plants, which thrive well if treated as advised for the other tuberous-rooted kinds, with the addition of a few more degrees of heat.

The *Rex* section requires a light rich soil, plenty of moisture, and a shaded position in a warm greenhouse. These kinds are often employed with good effect for clothing peat-covered walls in ferneries, or as an undergrowth in large tropical houses. Large specimens have been grown under the stage in a warm house, the shade and moisture of such a position being exactly what they best delight in.

B. socotrana, an interesting species from the island of Socotra, is somewhat singular in its requirements. The stem is herbaceous and annual, and about its base a cluster of bulbils are formed, from every one of which a plant will be developed the following year. The growing season for this species is from September to March, after which it goes to rest for the whole summer. A tropical temperature and all the light possible, are essential to the well-doing of this plant.

It is interesting to note the apparent impossibility to cross any of the shrubby Begonias with the distinctly tuberous-rooted species; and even the species of the shrubby section, whose stems are semi-tuberous, have hitherto refused to commingle with the South American tuberous kinds, of which *B. Veitchii*, *B. rosæflora*, and *B. boliviensis* may be said to be typical. The infusion of the blood of these large, handsome-flowered kinds into the tall, shrubby species, would almost certainly result in the production of a race of splendid winter-flowering greenhouse plants, and it is therefore in every way desirable that no pains should be spared to break through the obstacle to the union of the two races.

Explanation of contractions: T, tuberous-rooted; S, shrubby.

B. acerifolia (Acer-leaved). S. A tall-growing, thick, succulent-stemmed species, with green, lobed, serrated foliage, and large branching cymes of small white flowers; sepals of male flowers hairy; styles three, two-horned. Capsule triangular, with one of the angles prolonged into an obtuse wing. Spring. Quito, 1829.

B. acuminata (taper-pointed-leaved). S. A low shrubby species, having semi-cordate, oblong, pointed leaves, with toothed margins, and the nerves on the under side and the petiole pilose. *fl.* white, in cymes, nearly 1in. across. Capsule wings, two short, the third ¼in. long. Spring. Jamaica, 1798. (B. M. 4025.)

B. acutifolia (acute-leaved). S. A smooth-stemmed, semi-erect species, 3ft. to 4ft. high, with cordate-oblong leaves, both sides and petiole glabrous, the margins denticulate. *fl.* in cymes, white and red, about 1in. in diameter. Capsule winged, one wing twice as long as the others. Spring. Jamaica, 1816. SYN. *B. purpurea.*

B. acutiloba (acute-lobed).* A species with thick fleshy rhizomes, and palmate cordate leaves which are divided into five to seven lobes, with toothed margins and pointed apices, under side thinly covered with brown hairs. Flower-stalk tall, hairy, surmounted by a branching head of rather large white flowers. Summer. Mexico.

B. albo-coccinea (white and red).* Stemless, with a thick root-stock. *l.* broadly ovate, peltate, entire, 3in. to 4in. long; petiole 3in. to 6in., pubescent. Flower-scape 6in. to 9in. long. *fl.* in dense cluster, bright rose on the outside, white within. Capsule regularly triangular, with short wings. Summer. India, 1844. SYN. *B. Grahamiana.* (B. M. 4172.)

B. alchemilloides (Alchemilla-like). Stem fleshy, creeping. *l.* rotundate, with toothed, undulate, ciliated margins and short

Begonia—*continued.*

stalks. Flower-stem slender, few-flowered. *fl.* small, rose-coloured. Summer. Brazil.

B. amabilis (lovely).* Stem creeping, fleshy, short. *l.* ovate, crenulate, acuminate, about 6in. long, tomentose, dark green, blotched with white, under side purple-red. Flower-stalk 9in. long. *fl.* rose or white, in clustering cymes. Capsule irregular. Summer. Assam, 1859. The foliage sometimes comes wholly green, but, under good treatment, it is handsomely variegated.

B. amœna (pleasing).* Rhizome tuberous. Stem none, or very short. *l.* 3in. by 2in.; leafstalk 3in. Flower-stem 6in. long, few-flowered. *fl.* medium sized, pale rose. Capsule wings small, nearly equal. Summer. North India, 1878. SYN. *B. erosa.*

B. ampla (large). S. Stem 1ft. to 2ft. high, very stout, woody. *l.* long-stalked, 8in. to 10in. in diameter, broadly ovate, cordate, pointed, when young densely covered with rusty stellate down. *fl.* on short petioles, rose-coloured, 2in. wide. Fruit a succulent berry, small. Summer. Guinea.

B. aptera (wingless). Stem herbaceous. *l.* heart-shaped, pointed, shining green. *fl.* in short axillary cymes, white, small. Capsule four-angled. Spring. Celebes, 1878.

B. arborescens (tree-like). S. A large growing species, sometimes forming a bush 8ft. to 10ft. in height. *l.* pale green, ear-shaped, 6in. long. *fl.* in large cymose clusters, white, small. Summer. Brazil.

B. argyrostigma (silvery-spotted). Synonymous with *B. maculata.*

B. Arnottiana (Arnott's). Synonymous with *B. cordifolia.*

B. asplenifolia (Asplenium-leaved). S. A slender-stemmed, beautifully cut-leaved species, the foliage of which is pinnatisect, giving the plant the appearance of a Thalictrum rather than a Begonia. *fl.* very small, white. Guinea.

B. assamica (Assam). Stem short, fleshy. *fl.* pinkish flesh-colour. *l.* oblique ovate, olive-green, marbled with silvery blotches above, and of a pale purplish-pink beneath; petioles pale green, softly hairy. Assam, 1883.

B. attenuata (attenuated). Synonymous with *B. herbacea.*

B. aucubæfolia (Aucuba-leaved). Synonymous with *B. incarnata.*

B. auriformis (ear-formed). Synonymous with *B. incana.*

B. barbata (bearded). S. Stem short, hairy. *l.* toothed, oval-shaped, pointed, hispid beneath, 4in. long. *fl.* medium-sized, white or pink; flower-stalk hairy. Capsule equal-winged. Summer. India.

B. Berkeleyi (Berkeley's).* T. A garden hybrid, with thick, fleshy stems, and long ear-shaped foliage. *fl.* in erect panicles, rose-coloured. A useful winter-flowering kind.

B. bipetala (two-petaled). Synonymous with *B. dipetala.*

B. biserrata (doubly-serrated). S. Stem erect, branched, 2ft. to 3ft. high. *l.* 6in. long, 2in. to 3in. wide, deeply lobed, toothed, pale green. *fl.* in loose cymes, drooping, rose-coloured, 1½in. wide, serrated edges. Capsule pilose, two short and one long wings. Summer. Guatemala, 1847. (B. M. 4746.)

B. boliviensis (Bolivian).* T. Stem herbaceous, succulent, 2ft. high, branching. *l.* lanceolate, pointed, serrate, 3in. to 5in. long. *fl.* in drooping panicles, large, scarlet, males twice as large as females. Capsule three-winged. Summer. Bolivia, 1857. (B. M. 5657.)

B. Bowringiana (Bowring's). Synonymous with *B. laciniata.* (B. M. 5657.)

B. braziliana (Brazilian). S. Stem erect, tall, succulent. *l.* oblique, ovate, toothed, slightly pubescent; principal nerves brownish; stalk hairy. *fl.* white or rose, small, in short, few-flowered cymes. Capsule wing ½in. long. Summer. Brazil.

B. Bruantii (Bruant's).* B. A garden hybrid between *B. Schmidti* and *B. semperflorens.* *l.* green, with a brownish tint. *fl.* white or rose, in erect panicles. Summer, 1883. Used as a bedding plant in summer.

B. bulbifera (bulb-bearing). Most likely a form of *B. gracilis.*

B. caffra (Kaffrarian). A variety of *B. Dregei.*

B. carolinæfolia (Carolinea-leaved). S. Stem erect, thick, fleshy. *l.* palmate, curiously divided into six to eight long ovate segments, each 6in. long. *fl.* in a dichotomous cyme, on long stalk, rose-coloured, small. Capsule small, wings one longer than others. Winter. Mexico, 1876. A singular-leaved species. (R. G. 1—25.)

B. Cathcartii (Cathcart's). S. Caulescent. *l.* heart-shaped, acute, glabrous; stalks of flowers and leaves hairy; flowers and fruit as in *B. barbata.* Summer. India. SYN. *B. nemophila.* (C. H. P. 13.)

B. Chelsoni (Chelsea).* T. A garden hybrid between *B. Sedeni* and *B. boliviensis.* Stem fleshy, 2ft. high. *l.* oblique, lance-shaped, irregularly lobed. *fl.* large, orange-red, drooping. Summer, 1874.

B. cinnabarina (vermilion).* S. Stem erect, short, herbaceous. *l.* 2in. to 4in. long, oblique, toothed; peduncles 6in. long, few-flowered. *fl.* (male), medium, red; female flowers very small. Summer. Capsule irregularly-winged. Bolivia, 1848. (B. M. 4483.)

B. cinnabarina (vermilion). A variety of *B. fuchsioides.*

Begonia—*continued.*

B. Clarkii (Clarke's).* T. Stem purplish, fleshy, stout. *l.* oblique-cordate, serrate. *fl.* in pendulous racemes, abundant, large, bright red, very handsome, nearly related to *B. Veitchii.* Summer. Peru and Bolivia, 1867. (B. M. 5675.)

B. coccinea (red).* S. Habit suffruticose. Stem sub-erect, 1ft. to 2ft. high, thick at the base. *l.* ovate-oblong, pointed; margins undulate and toothed. *fl.* in pendulous racemes, medium-sized; flowers and peduncles red. Capsule nearly regular; wings short. Summer. Brazil, 1842. (B. M. 3990.)

B. conchæfolia (shell-leaved). Stem creeping, rhizomatous, thick. *l.* peltate, ovate, 3in. to 5in. long, edges almost entire; under side, along with leaf and flower-stalks, covered with ferruginous hairs; scape 9in. long, erect, surmounted by corymb of small whitish fragrant flowers. Capsule wings, one long, two short. Autumn and winter. South America, 1852. SYNS. *B. scutellata, B. Warscewiczii.* (R. B. 246.)

B. corallina (coral-flowered). S. Stem woody, branching, sub-erect, browish when matured. *l.* ovate-oblong, pointed, undulate, smooth, dull green, under side purple. *fl.* in long pendent racemes, numerous, medium-sized, bright coral-red. Summer. Brazil (?), 1875. A rare species, and one of the handsomest of the shrubby kinds, most likely closely related to *B. maculata.*

B. cordifolia (heart-shaped). T. Stemless; rootstock fleshy. *l.* cordate, orbicular, toothed, 3in. wide, pilose above, pubescent below; flower-scape 6in. long, dichotomous. *fl.* numerous, medium-sized. Capsule with three narrow wings. Winter. Ceylon and India. SYN. *B. Arnottiana.*

B. coriacea (leathery).* T. Stem 6in. high, herbaceous. *l.* reniform, 5in. wide by 3in. long, smooth above, pilose below. *fl.* rose-coloured, large, in twos or threes on the end of an erect scape, 8in. to 10in. long. Wings of capsule short, red. Summer. Bolivia.

B. coriacea (leathery). Synonymous with *B. peltata.*

B. crassicaulis (thick-stemmed). Stem short, thick, articulated, succulent. *l.* palmate; segments acuminate, toothed, under side clothed with rusty down. *fl.* in many-flowered cymes, dipetalous, white or rose-coloured, medium-sized. Capsule wings unequal. Near to *B. heracleifolia.* Spring. Guatemala, 1841. (B. R. 28, 44.)

B. crinita (hairy).* S. Stem 1ft. high, fleshy, bright red, more or less hairy. *l.* ovate-cordate; margins toothed, dark green; petiole red and hairy, like the stems. *fl.* in lax, branching cymes, rose-coloured, 1½in. in diameter. Fruit three-winged, one long and acute, two short and rounded. Spring. Bolivia, 1870. (B. M. 5897.)

B. cucullata (hooded). A variety of *B. semperflorens.*

B. dædalea (adorned).* Stem short, thick, succulent. *l.* large, green, thickly covered with a close network of russet-brown, scarlet when young; edges pilose. *fl.* white and rose, in loose panicles. Mexico, 1860. A handsome foliaged plant. (L. H. 1861, 269.)

B. Daveauana. *See* **Pellionia Daveauana.**

B. Davisii (Davis's).* T. stemless, *l.* springing directly from rootstock, ovate-cordate, shining green, slightly hairy, under-side red; petiole short, fleshy. Flower-scapes, pedicels, and flowers bright red; scape 4in. high, bearing half a dozen flowers in umbel. Capsule three-winged, one long, two very short. Summer. Peru, 1876. A handsome tuberous-rooted species, dwarf. See Fig. 228, for which we are indebted to Messrs. Veitch and Sons. (B. M. 6252.)

B. dichotoma (branching). S. Stem tall, stout, fleshy. *l.* 5in. long by 4in. wide, lobed, dull green. *fl.* white, on long axillary scapes, numerous. Winter. 1860.

B. Digswelliana (Digswell's). Stem short, semi-decumbent, large, green; margins red. *fl.* on long, erect scapes, pale pink, small, numerous. Useful for winter flowering purposes. A garden hybrid. (F. M. 236.)

B. dipetala (two-petaled). Stems springing from a fleshy rootstock, erect, 18in. high, brown, *l.* half heart-shaped; margins toothed, upper surface thickly spotted with white, under side red. *fl.* in loose axillary cymes, two-petaled, large, pink. Capsule equal-winged. Spring. India, 1828. A handsome species. (B. M. 2849.) SYN. *B. bipetala.*

B. discolor (two-coloured). Synonymous with *B. Evansiana.*

B. diversifolia (diverse-leaved). A variety of *B. gracilis.*

B. Dregii (Drege's).* Rootstock fleshy. Stems succulent; annual, 1ft. high. *l.* oblique, thin, green, slightly spotted with grey, reddish on the under side. *fl.* white, about 1in. across, in axillary cymes. Capsule three-winged, one much longer than the other two, and acute-pointed. Summer. Cape, 1840. SYNS. *B. caffra, B. reniformis.*

B. echinosepala (spiny-sepaled).* Stem green, succulent, 18in. high. *l.* small, obliquely-oblong, serrulate. *fl.* on axillary peduncles, white, with curiously papillose sepals. Summer. Brazil, 1872. (R. G. 707.)

B. elliptica (elliptic). Synonymous with *B. scandens.*

B. erecta multiflora (erect, many-flowered). *fl.* bright reddish-pink, produced for several months, but especially during the winter. *l.* oblique, deep bronze coloured, very conspicuous. A decidedly handsome and very useful garden variety.

Begonia—*continued.*

B. erosa (bitten). Synonymous with *B. amœna.*

B. Evansiana (Evans's).* T. Stem herbaceous, branching, smooth, 2ft. high. *l.* oblique, ovate-acute, sub-cordate, lobed; margins denticulate, green above, under side and petioles deep red; flower-stalks branching, axillary. *fl.* numerous, flesh-coloured, large. Capsule wings blunt-pointed, one longer than the others. Summer. Java, China, Japan, 1812. A handsome species, and almost hardy. SYNS. *B. discolor, B. grandis.* (B. M. 1473.)

B. eximia (excellent).* A hybrid, raised from *B. rubro-venia* and *B. Thwaitesii.* Stem short, succulent. *l.* bronzy-purple, tinged with red. A handsome foliage plant. (I. H. 1860, 233.)

B. falcifolia (sickle-leaved).* S. Stem 1ft. to 2ft. high, erect, branching. *l.* 6in. long, 1½in. wide, curved, tapering to a narrow point; margins toothed, upper surface green, more or less spotted with white, under side deep red. *fl.* on short axillary peduncles, drooping, dipetalous, bright red. Wings of capsule equal, ½in. wide. Summer. Peru, 1868. A pretty flowering plant. (B. M. 5707.)

B. ferruginea (rust-coloured). S. Stem woody, erect, smooth branching, covered with ferruginous hairs. *l.* oblique, ovate-acute, acuminate, lobed; margins toothed. *fl.* in branching cymes, large red. Capsule unequal-winged. Summer. Bogota. SYN. *B. magnifica.*

B. Fischeri (Fischer's). Similar to *B. falcifolia,* except that the foliage is unspotted, and the flowers are white and small. Brazil, 1835. (B. M. 3532.)

B. foliosa (leafy).* S. Stem slender, branching, fleshy. *l.* small, ovate-oblong, dark green, numerous, distichous on stems. *fl.* small, numerous, white, tinged with pink. Summer. New Grenada, 1868. Useful for growing in hanging baskets. SYN. *B. microphylla.* (Bot. B. 222.)

Begonia—*continued.*

B. frigida (frigid). S. Stem 1ft. high, smooth, green, succulent. *l.* cordate, acuminate, lobed, serrated, slightly pilose; upper side coppery-green, beneath deep rose-red, especially upon the veins. *fl.* small, white, in erect branching cymes. Capsule wings two long, one short. Summer. Country unknown, 1860. (B. M. 5160.)

B. Frœbeli (Frœbel's).* T. Stemless. *l.* numerous, cordate, acuminate, green, covered with purplish-velvety hairs. *fl.* in tall, lax, drooping, branching cymes, brilliant scarlet, large. Winter. Ecuador, 1872. A beautiful flowering plant, useful for conservatory work in winter. (Garden, pl. 96.)

B. fuchsioides (Fuchsia-like).* S. Stem tall, drooping, herbaceous, smooth, green, tinged with red. *l.* copious, distichous, 1½in. long, oblong-ovate, slightly falcate, serrated, smooth; margins tinged with red. *fl.* in branching pendulous panicles, numerous, rich, deep scarlet. Capsule wings two very short and one long. Summer. New Grenada, 1846. A handsome greenhouse plant, useful for covering pillars, &c. SYN. *B. miniata.* (B. M. 4281.)

FIG. 228. BEGONIA DAVISII.

B. f. miniata (vermilion). *l.* smaller than in type. *fl.* cinnabar red. (F. d. S. 8, 787.)

B. gemmipara (bud-bearing). S. Stem 1ft. high, from a tuberous rootstock, succulent, *l.* ovate-acuminate, cordate, lobed, smooth above, pilose below. *fl.* medium-sized, white, or with rose stripes, on pendulous, axillary peduncles; sometimes the peduncles bear, instead of flowers, quadrangular cups, which are closely packed with oblong viviparous bulbils. Summer. Himalaya. (C. H. P. 14.)

B. geranifolia (Geranium-leaved).* Rootstock tuberous. Stem 1ft. high, erect, angular, succulent, green, with a purplish tinge, branched dichotomously. *l.* cordate, cut into unequal serrated lobes, green; margins red, whole plant perfectly smooth;

Begonia—*continued.*

peduncles terminal, bearing two to three flowers, which are inclined, drooping while in bud; outer petals orbicular, red, the two inner obovate, waved white. Summer. Lima, 1833. (B. M. 3387.)

B. geranioides (Geranium-like).* T. Rootstock fleshy. Stemless. *l.* radical, somewhat reniform, lobed, serrated; surface scabrid, deep green; leafstalks red, hairy. *fl.* white, in lax, drooping panicle. Summer. Natal, 1866. A pretty, though delicate, species. (B. M. 5583.)

B. glandulosa (glandular-leaved).* Stem a stout rhizome, scaly. Leafstalks thick, terete, erect, hairy, 9in. high. *l.* 6in. broad, fleshy, cordate, lobed, green; veins dark. *fl.* on tall, dark, erect scapes, numerous, greenish-white. Capsule wings, one very large, blunt. Costa Rica, 1854. SYNS. *B. hernandiæfolia*, *B. nigro-venia*. (B. M. 5256.)

FIG. 229. BEGONIA HERACLEIFOLIA.

B. gogoensis (Gogoan).* *l.* peltate, ovate-orbicular, oblique, acute when young, with a bronzy metallic hue, ultimately changing to a deep velvety-green, intersected by the paler midribs and veins; the under surface deep red. *fl.* pale rose, in a lax panicle. Gogo, in Sumatra, 1881. A very handsome, ornamental-foliaged species.

B. gracilis (slender).* T. Stem erect, unbranched, very succulent, *l.* thinly scattered along stems, half heart-shaped, slightly hairy, lobed, denticulate-ciliate. *fl.* on short axillary peduncles; umbel of few male and female flowers, two larger petals serrate, colour pink. Capsule winged, green. Mexico, 1829. In axils of leaves between stipules a cluster of bulbils are borne; these may be gathered and sown as seeds. This and its varieties, *annulata*, *diversifolia*, *Martiana*, &c., are beautiful summer flowering greenhouse Begonias, requiring a sandy peat soil and shade. When well grown, they are exceedingly ornamental. (B. M. 2966.)

Begonia—*continued.*

B. Grahamiana (Graham's). Synonymous with *B. albo-coccinea*.

B. grandiflora (large-flowered). Synonymous with *B. octopetala*.

B. grandis (great). A variety of *B. Rex*.

B. grandis (great). Synonymous with *B. Evansiana*.

B. grandis (great). Synonymous with *B. vitifolia*.

B. Griffithii (Griffith's). Stemless; rhizome subterraneous. *l.* large, obliquely-cordate; margin crenate, hairy; surface granulated, colour a dark green; margin purple, zoned with grey, under side green, centre and margin deep purple. *fl.* on cymes, large, white internally, outside tinged with blush, slightly pilose. Capsule tubercled, one wing large, projecting. Winter. India, 1856. (B. M. 4984.)

B. Hasskarlii (Hasskarl's). Synonymous with *B. peltata*.

B. heracleifolia (cow-parsnip leaved). Rootstock thick, fleshy. *l.* radical, on long pilose stalks, palmate, large, bronzy green; margins toothed, hairy. Flower-stalks long, stout, erect, hairy, many-flowered. *fl.* rose-coloured. Capsule wings nearly equal. Spring. Mexico, 1831. This and the following varieties are handsome both in foliage and flowers. SYNS. *B. jatrophæfolia*, *B. punctata*, *B. radiata*. See Fig. 229. (B. M. 3444.)

B. h. longipila (long-haired). *l.* greyish in middle; outer portions dark bronzy, blotched with green. Whole plant covered with long, stiff, fleshy hairs. *fl.* as in the type.

B. h. nigricans (dark). This differs from the type in having foliage of a blackish tint all round the margins of the lobes, and the petals of the flowers nearly white. (B. M. 4983.)

B. h. punctata (dotted). *l.* green, reddish near margin. *fl.* rose-colour, with deep red spots on the outside.

B. herbacea (herbaceous).* Rhizome creeping. *l.* oblong-acute, lanceolate, toothed, ciliated. Flower-stalks shorter than leaves; male flowers in a cymose head, white, small; female flowers solitary, on very short stalks. Spring. Brazil, 1873. A small species, very succulent, with the appearance of a primrose when not in flower. SYN. *B. attenuata*. (G. C. 1873, 679.)

B. hernandiæfolia (Hernandia-leaved). Synonymous with *B. glandulosa*. (Seemann.)

B. hernandiæfolia (Hernandia-leaved). Synonymous with *B. nelumbiifolia*. (Gardens.)

B. hernandiæfolia (Hernandia-leaved). Synonymous with *B. peltata*. (B. M. 4676.)

B. hirsuta (hairy). Synonymous with *B. humilis*.

B. Hookeri (Hooker's). A variety of *B. semperflorens*.

B. Hookeriana (Hooker's). S. Stem woody, 5ft. to 6ft. high, branching, covered with minute rusty tomentum. *l.* ovate, unequal sided, blunt, 8in. long, tomentose, like the stem. *fl.* in axillary cymes, small, white. Spring. Brazil, 1850.

B. humilis (dwarf).* Stem erect, fleshy, hairy. *l.* semicordate-oblong, acuminate, ciliate-serrate, hairy above, smooth beneath. *fl.* few, in cymes, small, white. Capsule unequal winged. Summer. Trinidad, 1788. Annual. SYN. *B. hirsuta*.

B. humilis (dwarf). Synonymous with *B. suaveolens*. (B. R. 294.)

B. hybrida floribunda (many-flowered).* A very beautiful summer blooming hybrid between *B. fuchsioides* and *B. multiflora*. *fl.* bright rose, medium sized, produced in abundance. Summer. One of the best.

B. hydrocotylifolia (Penny-wort-leaved).* Stem succulent, short, creeping. *l.* rotundate cordate, almost equal-sided; petiole short. Whole plant hairy. Flower-stalks 1ft. high, pilose. *fl.* in cymose head, medium-sized, dipetalous, rose-coloured, as also are pedicels and stalk. Capsule wings equal-sized, large. Summer. Mexico, 1841. (B. M. 3968.)

B. h. asarifolia (Asarum-leaved). Leaves and flowers smaller than in the type, the latter white. Mexico.

B. imperialis (imperial).* Stem rhizomatous, short, thick. *l.* large, broad, ovate-acute, cordate, rugose, hairy, dark olive-green; nerves banded with greyish-green colour. *fl.* in cymes, white, medium-sized. *fr.* unequal winged. Mexico, 1851. A handsome foliage species. (I. H. 1860, 262.)

B. i. smaragdina (emerald-like). *l.* shining emerald green.

B. incana (hoary). Stem erect, fleshy, tomentose. *l.* leathery, peltate, oblong-acute, sub-angular, whitish beneath. Flower-stalks long. *fl.* in small downy panicles, white. Winter. Mexico, 1840. SYN. *B. auriformis*.

B. i. auriformis (ear-like). *l.* divided at the base, not peltate. *fl.* glabrous.

B. incarnata (fleshy).* S. Stem erect, fleshy, 2ft. high, smooth; nodes swollen, reddish, spotted. *l.* on short, smooth petioles, unequally cordate, acuminate, sinuately-serrate, green. *fl.* large, rose-coloured, handsome; peduncles terminal, nodding. Capsule with unequal wings, the largest acute. Winter. Mexico, 1822. SYNS. *B. aucubæfolia*, *B. insignis*, *B. Lindleyana*. (B. M. 2500.)

B. i. maculosa (spotted). *l.* spotted with white.

B. i. metallica (metallic-leaved). *l.* with a bronzy-purple metallic lustre.

Begonia—*continued.*

B. i. papillosa (papillose). Foliage margined with bright rose; upper surface covered with little papillæ. (B. M. 2846.)

B. i. purpurea (purple-leaved). Foliage deep bronzy-purple.

B. Ingramii (Ingram's).* A garden hybrid, raised at Frogmore in 1849, from *B. fuchsioides* and *B. nitida*. It combines the characters of the two parents. A useful winter-flowering plant; may be grown out of doors in summer. (G. M. B., p. 153.)

B. insignis (remarkable). Synonymous with *B. incarnata*.

B. involucrata (involucrate). S. Stem erect, tall, angular, covered with a reddish tomentum. *l.* oblique, ovate-acuminate, cordate; margins toothed and ciliate. *fl.* enclosed in a wrapper, or involucre, when young; peduncles graceful, bearing umbel of white, largish flowers. Capsule wings unequal, the largest falcate. Winter. Central America.

B. jatrophæfolia (Jatropha-leaved). Synonymous with *B. heracleifolia*.

B. Josephi (Joseph's). Stemless. *l.* radical, on petioles 6in. to 10in. long, ovate-acuminate, three-lobed, or orbicular, with numerous acute lobes, slightly pubescent; scape 1ft., branched. *fl.* small, rose-coloured. Capsule wings unequal; upper margins horizontal. Summer. Himalaya.

B. Kunthiana (Kunth's).* S. Stem erect, smooth, slender, purple-brown. *l.* on short petioles, lance-shaped, acuminate, regularly serrated, smooth, dark green above, bright crimson below. *fl.* axillary, on short nodding peduncles, white, large, handsome. Summer. Venezuela, 1862. A pretty species. (B. M. 5284.)

B. laciniata (cut-leaved).* Rhizome thick, fleshy. Stem short, thick, jointed, reddish, woolly. *l.* large, 6in. to 10in. long, 4in. to 6in. broad, unequally cordate; margins irregularly cut, serrated; upper side green, under dull, rufous. *fl.* on short axillary peduncles, large, white, tinted with rose. Capsule wings, one very long, others short. Spring. Nepaul to Birma, South China, 1858. SYN. *B. Bowringiana*. (B. M. 5182.)

B. Leopoldi (Leopold's). A hybrid from *B. Griffithii* and *B. splendida*, with large variegated foliage. 1858.

B. Lindleyana (Lindley's).* S. Stem erect, fleshy, covered with ferruginous hairs. *l.* on long petioles, peltate, ovate, acute, 5in. to 6in. long, 3in. to 4in. wide, irregularly lobed, toothed, green above, tomentose below. *fl.* on branching peduncles, medium sized, white. Winter. Guatemala.

B. Lindleyana (Lindley's). A garden synonym of *B. incarnata*. (Gardens.)

B. longipes (long-stalked). S. Stem 3ft. or more high, stout, succulent, furrowed, covered with glands *l.* large, rotundate-cordate; margin irregular, serrated, both sides green, pubescent when young. *fl.* numerous, small, white; peduncle 1ft. long, branched. Winter. Colombia, 1829. (B. M. 3001.)

B. longipila (long-haired). A variety of *B. heracleifolia*.

B. lucida (shining). Synonymous with *B. scandens*.

B. Lynchiana (Lynch's). S. Stem erect, tall, succulent, smooth. *l.* fleshy, 10in. long, oblique, ovate cordate, crenulate, green, smooth. *fl.* axillary, in drooping cymes, numerous, large, deep reddish-crimson. Winter. Mexico, 1880. One of the finest of the tall-growing winter-flowering species. When well managed, the flower-heads are almost a foot in diameter. SYN. *B. Roezlii*, of gardens. (B. M. 6758.)

FIG. 230. BEGONIA MACULATA, showing Habit, Section of Capsule, and Flower.

B. maculata (spotted).* S. A woody shrub. Stems branching, smooth. *l.* oblique, ovate-oblong, leathery, slightly undulate; margins entire, under side bright crimson, above green, with numerous arge round blotches of silvery white. *fl.* in drooping

Begonia—*continued.*

panicles, coral-like, handsome. Capsule with one long, narrow wing. Summer. Brazil, 1821. (B. R. 666.) There are numerous varieties of this species, some with leaves almost green, others with the markings more striking than in the type; in the flowers they differ also, ranging from white to coral-red. The beautiful *B. corallina* is probably a variety of this. SYN. *B. argyrostigma*. See Fig. 230.

B. magnifica (magnificent).* S. Stem erect, fleshy, smooth. *l.* ovate, unequal sided, toothed. *fl.* in terminal, cymose panicles, rosy-carmine, 1½in. long. New Grenada, 1870. (R. H. 1870, 271.)

B. magnifica (magnificent). Synonymous with *B. ferruginea*.

B. malabarica (Malabar).* Stem thick, succulent, 2ft. high, branching. *l.* numerous, cordate, acute, unequal-sided, crenate or serrate, hairy above and sometimes below, or altogether glabrous, spotted white. *fl.* rose-coloured; peduncles axillary, short, few-flowered. Capsule wings equal, joined above and below. Summer. Malabar and Ceylon, 1828. *B. dipetala* is made a variety of this, by Sir Joseph Hooker, in "Flora of British India." (L. B. C. 1730.)

FIG. 231. BEGONIA MANICATA.

B. manicata (tunicated).* Stem fleshy, twisted, short. *l.* oblique, ovate-acute, cordate, dentate-ciliate, smooth on both sides, shining green nerves on under side, with fleshy, scale-like hairs. *fl.* pink, dipetalous, in branching cymes; upper portion of stalk scaly. Capsule wings nearly equal. Winter. Mexico, 1842. See Fig. 231.

B. Manni (Mann's). S. Stem succulent, 2ft. to 3ft. high, branched, green; branchlets, young parts, petioles, and leaf-nerves clothed with rusty, furfuraceous pubescence. *l.* petioled, 5in. long, 2in. wide, lanceolate, cordate, acuminate, toothed. *fl.* numerous, rose-red, in axillary cymes; peduncle 1in. long. Capsule linear, densely tomentose. Winter. Fernando Po, 1862. (B. M. 5434.)

B. marmorea (spotted). A variety of *B. xanthina*.

B. Martiana (Martius'). A variety of *B. gracilis*.

B. maxima (large).* Rhizome thick, hairy, creeping. *l.* large, oblique, orbicular-ovate, cordate, shortly acuminate; margins denticulate ciliate; petiole long, pilose. *fl.* in branching cymes; sepals orbicular, pilose on the outside, white. Summer. Mexico, 1853.

B. megaphylla (large-leaved).* Stem short, thick, fleshy. *l.* large, palmate, cordate; lobes numerous, pointed; margins hairy, under side slightly pilose; nerves with scaly hairs. *fl.* in diffuse cymes, small, white; peduncles pilose. Capsule wings wide. Winter. Mexico.

B. metallica (metallic). A variety of *B. incarnata*.

B. Meyeri (Meyer's). S. Stem erect, stout, woody when mature. *l.* large, broadly and obliquely ovate, fleshy, pale green; margin sinuate, under side tinged with rose; both petiole and blade covered with short hairs. *fl.* on long axillary peduncles, in large paniculate heads, white. Capsule wings equal. Summer. Brazil, 1844. (B. M. 4100.)

B. microphylla (small-leaved). Synonymous with *B. foliosa*.

B. microptera (small-winged). Stem 1ft. high, terete, green, pubescent, as in the rest of the plant. Branches few. *l.* sub-distichous, 4in. to 6in. long, ovate-lanceolate, acuminate, serrated, dark green; petiole short; stipules as long as petiole. *fl.* in terminal panicles, medium-sized, white, tinted rose. Capsule long, triangular, two angles wingless, the other with a narrow wing. Winter. Borneo, 1856. (B. M. 4974.)

B. miniata (vermilion). A variety of *B. fuchsioides*.

B. monoptera (single-winged).* Stem erect, 1ft. to 2ft. high, rounded, swollen at the joints, dull red, papillose and downy. Radical leaves on long red stalks, large, reniform, truncate at the base; caulescent leaves smaller, on short petioles, angled,

Begonia—*continued.*

crenate, dark green above, red below, and minutely papillose. *fl.* on an elongated terminal raceme, white. Capsule three-angled, two wingless, the other with a long pointed wing. Summer. Brazil, 1826. A distinct and pretty species. (B. M. 3564.)

B. Moritziana (Moritz's). Synonymous with *B. scandens.*

B. natalensis (Natal).* T. Rootstock thick, fleshy. Stem 1½ft. high, succulent, thick at the base, articulate, branched, smooth. *l.* unequal, semicordate, acuminate, lobed, toothed, spotted with white. *fl.* on axillary cymose peduncles, pale rose. *fr.* three-winged, two large, one small. Winter. Natal, 1855. (B. M. 4841.)

B. nelumbiifolia (Nelumbium-leaved).* Rhizome thick, fleshy, creeping. *l.* on long hairy petioles; blade 12in. to 18in. long, 8in. to 12in. wide, peltate, hairy on under side; scape 1ft. to 2ft. high. *fl.* in cymose head, numerous, small, white or rose coloured. Winter. Mexico. A noble-foliaged plant. SYN. *B. hernandiæfolia.*

B. nemophila. Synonymous with *B. Cathcartii.*

B. nigro-venia (black-veined). Synonymous with *B. glandulosa.*

B. nitida (shining).* S. Stem 4ft. to 5ft. high, erect, branched, woody when aged, smooth, shining. *l.* large, glossy, green on both sides, obliquely ovate, acute, crenated at margin. *fl.* in terminal and axillary panicles, numerous, large, deep rose, handsome. Capsule three-winged, one much larger than others. Jamaica, 1777. One of the best winter, and almost a perpetual, flowering species. SYNS. *B. obliqua, B. pulchra, B. purpurea.* (B. M. 4046.)

B. obliqua (oblique). Synonymous with *B. nitida.*

B. octopetala (eight-petaled).* T. Stemless. *l.* on long succulent downy petioles, 1½ft. or more in length, cordate, 6in. long, deeply lobed and serrated at the margin, bright green; scape as long as petioles, rounded, downy. *fl.* in corymbs, greenish-white, males with eight petals, females generally fewer. Capsule three-angled, two wings almost suppressed, the other 1in. long; apex blunt, toothed. Autumn. Peru, 1835. SYN. *B. grandiflora.* (B. M. 3559.)

B. odorata (sweet-scented). Synonymous with *B. suaveolens.*

B. opuliflora (Guelder-rose-flowered).* S. Stem 1ft. high, branching, smooth. *l.* ovate oblong-acuminate, toothed, smooth above, hairy below. *fl.* white, in compact umbels, on erect scapes. Spring. New Grenada, 1854.

B. Ottoniana (Otton's). A hybrid from *B. conchæfolia* and *B. coriacea.* (R. G. 1859, p. 15.)

B. papillosa (papillose). A variety of *B. incarnata.*

B. Pearcei (Pearce's).* T. Stem 1ft. high, succulent, branching. *l.* lance-shaped, cordate, pointed, toothed, glabrous above, tomentose beneath, and pale red. *fl.* in loose axillary panicles, large, bright yellow. Summer. Bolivia, 1865. Interesting because of its being one of the progenitors of the handsome race of garden tuberous Begonias.

B. peltata (shield-like). Stem short, tomentose; leaves 6in. by 4in., peltate, ovate, densely pilose. *fl.* in branching cyme, small, white; peduncle 6in. to 9in., pilose. Brazil, 1815. Interesting because of its distinctly peltate foliage and silvery appearance of whole plant. SYNS. *B. coriacea, B. Haskarlii, B. hernandiæfolia, B. peltifolia.*

B. peltifolia (peltate-leaved). Synonymous with *B. peltata.*

B. phyllomaniaca (proliferous-stemmed). S. Stem thick, fleshy, rather twisted, green, hairy, clothed, when old, with small viviparous buds bearing small leaves, by which means the plant may be multiplied. *l.* ovate, acuminate, cordate, sinuately lobed, ciliate, smooth above and below. *fl.* in axillary cymes, drooping, pale rose. Capsule with one large wing. Winter. Guatemala, 1861. (B. M. 5254.)

B. picta (ornamented).* T. Stem generally smooth, succulent, 6in. to 12in. high. *l.* ovate acuminate, nearly equally cordate, serrated, hairy above and on the nerves below, sometimes variegated. *fl.* pale rose, large, handsome; peduncle hairy, erect, short, few-flowered. Autumn. Himalaya, 1870. (S. E. B. 101.)

B. platanifolia (Plane-leaved).* S. Stem 5ft. to 6ft. high, erect, robust, smooth, green; joints annulated. *l.* 8in. to 10in. in diameter, reniform, lobed, hispid on both sides, dark green; lobes acute, toothed, ciliated. *fl.* in axillary, dichotomous cymes, large, white, tinted rose, handsome. Summer. Brazil, 1834. (B. M. 3591.)

FIG. 232. BEGONIA POLYPETALA.

B. polypetala (many-petaled). Stem about 1ft. high, covered with a soft whitish tomentum. *l.* ovate-acute, toothed, pubescent above, and densely tomentose below. *fl.*, petals nine or ten, of a fine red colour, smooth, external ones ovate-oblong, pointed; internal ones somewhat shorter and narrower; sepals two, ovate-elliptic. Capsule tomentose, three-winged, with one wing larger, ascendent. Winter. Andes of Peru, 1878. See Fig. 232. (Garden, Dec. 14, 1878.)

B. prestoniensis (Preston).* A garden hybrid between *B. cinnabarina* and *B. nitida.* *l.* green, lobed, glabrous. *fl.* brilliant orange-red, in drooping axillary cymes, very fragrant. Autumn and winter. 1867. (G. M. B. 3, 149.)

B. prismatocarpa (prism-fruited).* Stems small, creeping, hairy; branchlets ascending. *l.* long, petioled, also hairy, obliquely cordate, ovate, three to five-lobed; lobes pointed, serrated; peduncles axillary, longer than foliage, bearing a small umbel of two to four dipetalous orange and yellow flowers, one female in each umbel. Capsule four-angled, scarcely winged. Summer. Tropical West Africa, 1861. The smallest of cultivated Begonias, and especially interesting because of its four-angled fruit. It forms a pretty cushion of bright shining green foliage, thickly studded with its brightly coloured flowers. Requires a stove temperature and a stony soil. (B. M. 5307.)

B. pruinata (frosted).* Stem short, thick, fleshy, smooth. *l.* large, peltate, ovate, angular-sinuate, minutely-toothed; surface smooth, glaucous; margins pilose, on stout, fleshy petioles. *fl.* in large dense dichotomous, or small cymes, white. Winter. Central America, 1870. (R. B. 247.)

B. pulchra (fair). Synonymous with *B. nitida.*

B. punctata (dotted). A variety of *B. heracleifolia.*

Begonia—*continued.*

B. purpurea (purple). Synonymous with *B. acutifolia.*

B. purpurea (purple). Synonymous with *B. nitida.*

B. Putzeysiana (Putzeys'). S. Stem erect, branching, smooth. *l.* oblong-lanceolate, acute, toothed, glabrous, under side spotted with white. *fl.* in copious small corymbs, white and rose, small. Capsule small, with rather large obtuse wings. Winter. Venezuela, 1871.

B. radiata (rayed). Synonymous with *B. heracleifolia.*

B. ramentacea (scaly).* S. Stem erect, branching, brown, scaly, as also are the leafstalks and peduncles. *l.* ovate, reniform, oblique; margins slightly angulate, recurved, under side red, scaly; peduncles branching. *fl.* drooping, pink and white, pretty. Capsule, when ripe, a bright scarlet; wings large. Spring. Brazil, 1839. (P. M. B. 12—73).

B. reniformis (kidney-formed). Synonymous with *B. Dregei.* (Gardens.)

B. reniformis (kidney-formed). Synonymous with *B. vitifolia.* (Hook.)

FIG. 233. BEGONIA REX.

B. Rex (Royal).* Stemless; rhizome fleshy, creeping, subterraneous. Leafstalk round, red, setose. *l.* 8in. to 12in. long, 6in. to 8in. broad, ovate, oblique, sides unequal, cordate, villose; margins toothed, surface bullate, dark olive-green, with a metallic lustre, a broad silvery zone running all round, about 1in. from the margin. *fl.* in erect branching cyme, large, pale rose. Capsule wings, two short, one long and rounded. Assam, 1858. See Fig. 233. (B. M. 5101.) This magnificent species is the principal progenitor of the numerous ornamental-foliaged Begonias, a selection of which are given below. Most of them are well worth growing, but those named have been selected from a large number: MADAME WAGNER,* *l.* large, profound green, banded by a broad silvery zone, especially fine; MARSHALLI, *l.* very large, the margins and very centre dark green, while the greater portion of the surface is covered with a silvery-grey; REGINA,* *l.* rich olive-green, banded with a broad zone of bronze-red and silvery-grey, rendering it very attractive; ROI LEOPOLD,* *l.* on long stout petioles, very large, deep bronze-red in the centre, with a broad border of a rather lighter shade, very effective; ROLLISONI,* *l.* large, on long stalks, rich velvety-green, banded with silvery-grey; SPLENDIDA ARGENTEA,* *l.* large, of a greyish hue, veined with white, and tinged with bronze-red, very beautiful. The following varieties are also very good: ADRIEN ROBINE,* BERTHE PROUTIERE, CHARLES HOVEY, DISTINCTION,* JULIA SEROT,* LOUISE CHRETIEN,* MADAME J. MENOREAU,* NARGA,* NAVALA,* TALISMAN, W. E. GUMBLETON.

B. Richardsiana (Richards').* T. Stem 1ft. high, erect, fleshy, with slender branches. *l.* palmately lobed, the lobes sinuate or toothed. *fl.* white, males bipetalous, females with five petals. Cymes axillary near ends of branches, few-flowered. Capsule three-winged, wings equal. Summer. Natal, 1871. (G. C., 1871, p. 1065.)

B. R. diadema (of gardens).* This is referred to here because of its close resemblance to the above. It is most likely a hybrid between *B. Richardsiana* and *B. dipetala.* *l.* palmately lobed, rather large, spotted with white. *fl.* large, rose-coloured. Summer. 1881.

B. ricinifolia (Ricinus-leaved).* A garden hybrid between *B. heracleifolia* and *B. peponifolia.* *l.* large, bronzy green, in shape like those of the Castor-oil plant. *fl.* numerous, on an erect scape. Winter. 1847.

B. Roezlii (Roezl's). Synonymous with *B. Lynchiana.*

B. rosacea (rosy). Stem succulent, short. *l.* ovate obtuse, slightly pubescent, toothed; petioles long, pilose. *fl.* in few-flowered cymes, medium-sized, rose-coloured. New Grenada, 1860. (Garden, pl. 152.)

B. roseflora (Rose-flowered).* T. Stemless. Petioles, scapes, bracts, and stipules bright red. *l.* green, 2in. to 4in. wide, on stout hairy petioles, 2in. to 6in. long, orbicular-reniform, concave; margins lobed, red, toothed. Scapes stout, villous, three-flowered. *fl.* 2in. across, bright rose-red. Summer. Peru, 1867. One of the parents of the popular race of tuberous-rooted large-flowered Begonias. (B. M. 5680.)

B. rubricaulis (red-stalked).* Stemless. Leafstalks, peduncles, pedicels, and ovaries, a deep red colour. *l.* obliquely ovate, 4in. to 6in. long, slightly hairy, bright green, wrinkled; margins toothed and ciliated. Scape 1ft. high, erect, stout, branching at the top, forming a head of about a dozen flowers, which are large, white inside, rose-tinted outside. Capsule with one large wing, the others almost suppressed. Summer. Peru, 1834. (B. M. 4131.)

B. rubro-venia (red-veined).* Rootstock thick. Stems 12in. to 18in. high, red, pubescent. *l.* 4in. to 6in. long, elliptic or lanceolate acuminate, entire or slightly angular, toothed, green spotted with white above, purplish-brown below. Scapes axillary, red. *fl.* in cymose head; outer segments white with rose-red veins, inner segments pure white. Summer. Sikkim, &c., 1853. (B. M. 4689.)

B. sanguinea (blood-red). S. Stems woody when old, tall, stout, red, with scattered paler spots. *l.* 4in. to 6in. long, unequally cordate, acuminate, thick and somewhat fleshy in texture, minutely crenate, green above, deep red below; peduncles axillary, long, erect, red. *fl.* in a branching cyme, rather small, white. Capsule wings sub-equal. Spring. Brazil, 1836. (B. M. 3520.)

B. scabrida (rough). Stem stout, erect, somewhat succulent, covered with small tubercles. *l.* 6in. long, oblique, ovate-acute, cordate, toothed, slightly hairy. *fl.* white, small; cyme many-flowered. Capsule wings equal, large. Venezuela, 1857.

B. scandens (climbing).* Stem flexuose, fleshy, creeping or climbing, smooth. *l.* 4in. long, ovate acuminate, subcordate; margins irregularly toothed, pale shining green. *fl.* in axillary branching cymes, white, small. South America, 1874. Useful either as a basket plant or for training against moist walls. SYNS. *B. elliptica, B. lucida, B. Moritziana.* (R. G. 758.)

B. sceptrum (princely). S. *l.* obliquely ovate in outline, deeply lobed on one side; lobes oblong; obtuse, veins sunk, and the raised spaces between marked with large silvery blotches, and numerous smaller dots of silver grey. Brazil, 1885.

B. Schmidtiana (Schmidt's).* Stems 1ft. high, branching, herbaceous. *l.* obliquely cordate, ovate-acute, small, dark metallic green above, tinged with red below. *fl.* in loose drooping axillary panicles, white, small, numerous. Winter. Brazil, 1879. (R. G. 990.)

B. scutellata (salver-like). Synonymous with *B. conchæfolia.*

FIG. 234. BEGONIA SEMPERFLORENS FRAU MARIA BRANDT, showing Habit and Flower.

B. Sedeni (Seden's). T. A garden hybrid between *B. boliviensis* and *B. Veitchii.* Summer. 1869. A handsome plant, but much inferior to many of the more recent hybrids. (R. H. 1872, 90.)

B. semperflorens (always-flowering).* Stem fleshy, erect, smooth, reddish-green. *l.* ovate-rotundate, hardly cordate;

Begonia—*continued.*

margins serrated, ciliated, surface smooth, shining green. *fl.* on axillary stalks, near apex of stems, white or rose, rather large. Capsule wings two short, one long, rounded. Autumn. Brazil, 1829. A useful summer and autumn flowering species, of which there are several named varieties more or less distinct from the type, either in colour or size of flowers, or in habit of plant. The varieties *carminea*, *gigantea*, and *rosea* are perhaps the best. SYN. *B. spathulata.* (B. M. 2920.)

B. s. Frau Maria Brandt. A dwarf compact variety, with rose-tinted flowers. See Fig. 234.

B. socotrana (Socotra).* Stem annual, stout and succulent, forming at base a cluster of bulbils, each of which produces a plant the following year; sparsely hairy. *l.* dark green, orbicular, peltate, 4in. to 7in. across, centre depressed; margin recurved, crenate. *fl.* in terminal, few-flowered cymes, 1½in. to 2in. wide, bright rose. Capsule three-angled, one-winged. Winter. Socotra, 1880. Should be rested through the summer, and started in heat in September. A distinct and beautiful species. (B. M. 6555.)

B. spathulata (spathulate). Synonymous with *B. semperflorens.*

B. stigmosa (branded).* Rhizome creeping, fleshy. *l.* 6in. to 8in. long, oblique, cordate-acute, irregularly toothed, smooth above, hairy beneath, green, with brownish-purple blotches; stalks scaly, as in *B. manicata.* *fl.* in cymose panicles, white, medium-sized, numerous. Brazil, 1845.

B. strigillosa (strigillose).* Rhizome short, fleshy, creeping, *l.* 4in. to 6in. long, oblique, ovate-acute, cordate-toothed; margins ciliate, red; stalk and blade covered with fleshy scales; blade smooth, blotched with brown. *fl.* in branching cymes, dipetalous, small, rose-coloured. Summer. Central America, 1851.

B. suaveolens (sweet-scented). S. Stem branching, 2ft. high, smooth. *l.* 3in. to 4in. long, oblique-ovate, cordate-acute, crenulate, glabrous. *fl.* in axillary panicles, large, white. Winter. Central America, 1816. Resembles *B. nitida*, but may be distinguished by its distinctly crenulate leaves and smaller flowers, which are white, and not pale rose, as in *B. nitida.* SYN. *B. odorata.* (L. B. C. 69.)

B. Sutherlandi (Sutherland's).* T. Stems annual, 1ft. to 2ft. high, slender, graceful, red-purple. *l.* on slender red petioles, 2in. to 3in. long; blade 4in. to 6in. long, ovate-lanceolate, deeply lobed at base; margins serrate, bright green; nerves bright red. *fl.* in axillary and terminal cymes, numerous, orange-red, shaded with dark vinous-red. Capsule wings equal. Summer. Natal, 1867. (B. M. 5689.)

B. Teuscheri (Teuscher's). S. A strong, erect-growing, large-leaved plant, from the Dutch Indies, not yet flowered. *l.* cordate-ovate, acute, olive-green above, with greyish blotches; under side rich claret-coloured. Hort. Linden. (I. H. 1879, 358.)

B. Thwaitesii (Thwaites's).* Stemless. *l.* 2in. to 4in. in diameter, obtuse or sub-acute, cordate at base, minutely toothed, slightly pubescent, very shaggy when young, rich coppery-green, red-purple and blotched with white; under side blood red. *fl.* in an umbel, medium-sized; scape short, white. Capsule shaped like a Beech nut; wings short. Ceylon, 1852. One of the most beautiful of coloured-leaved Begonias, requiring a close, moist atmosphere in a stove. (B. M. 4692.)

B. ulmifolia (Elm-leaved). S. Stem 2ft. to 4ft. high, branching. *l.* 3in. to 4in. long, ovate-oblong, unequal-sided, toothed, rugose, hairy. *fl.* on hairy peduncles, numerous, small, white. Capsule wings two small, one large, ovate. Winter. Venezuela, 1854. (L. C. 638.)

B. undulata (wavy-leaved). S. Stem 2ft. to 3ft. high, erect, branching freely, turgid below, green, succulent until old. *l.* distichous, oblong-lanceolate, undulated, smooth, shining green. *fl.* in nodding axillary cymes, white, small. Winter. Brazil, 1826. (B. M. 2723.)

B. urophylla (caudate-leaved). Stemless. Leafstalks terete, succulent, clothed with scattered bristly hairs. *l.* large, 12in. long, broad, cordate; margin irregularly cut, toothed; apex long-pointed, green, smooth above, hairy beneath; peduncle stout, paniculate. *fl.* crowded, large, dipetalous, white. Spring. Brazil. (B. M. 4855.)

B. Veitchii (Veitch's).* T. Stem very short, thick, fleshy, green. *l.* orbiculate, cordate, lobed and incised; margins ciliated, green, principal nerves radiating from bright carmine spot near centre; under side pale green; petiole thick, terete, with a few hairs on the upper portion; scape 10in. to 12in. high, thick, terete, pilose, two-flowered. *fl.* 2½in. in diameter, cinnabar red. Capsule smooth, two short, one long wings. Summer. Peru, 1867. One of the species from which the popular garden tuberous-rooted Begonias have been obtained. (B. M. 5663.)

Begonia—*continued.*

B. Verschaffeltiana (Verschaffelt's).* A hybrid between *B. carolinæfolia* and *B. manicata*, with large ovate acutely-lobed leaves and flowers in large cymes, rose-coloured and pendent. Winter. (R. G. 1855, p. 248.)

B. vitifolia (Vine-leaved). S. Stem 3ft. to 4ft. high, thick, smooth, and fleshy. *l.* large as vine foliage, and similar in shape; peduncles axillary, erect, branching into a cymose head of small white flowers. Capsules three-angled, one-winged. Winter. Brazil, 1833. SYNS. *B. grandis*, *B. reniformis.* (B. M. 3225.)

B. Wagneriana (Wagner's). S. Stem 2ft. to 3ft. high, erect, glabrous, green, succulent, branched. *l.* cordate-ovate, acuminate; margins obscurely lobed, slightly serrate, quite glabrous; peduncles axillary and terminal, cymose. *fl.* numerous, white. Capsules, which are ripened in abundance, three-angled, one wing long, two short. Winter. Venezuela, 1856. (B. M. 4988.)

B. Warscewiczii (Warscewicz's). Synonymous with *B. conchæfolia.*

B. Weltoniensis (Welton). A garden hybrid; one of the oldest of cultivated winter-flowering kinds, with light pink flowers, very free.

B. xanthina (yellow-flowered).* Stem short, thick, fleshy, horizontal, along with petioles thickly-clothed with brown scaly hairs; petioles 6in. to 12in. long, stout, terete, fleshy, reddish-brown; blade 8in. to 12in. long, cordate-ovate, acuminate, sinuate-ciliated, dark green above, purplish beneath. Flower-stalks erect, 1ft. high, bearing a cymose head of large golden flowers. Capsule with one large wing. Summer. Boutan, 1850. (B. M. 4683.)

B. x. Lazuli (Lapis-lazuli).* Foliage metallic purple, with a bluish tinge.

B. x. pictifolia (ornamented-leaved).* *l.* with large silvery spots, and pale yellow flowers.

The following list comprises a selection of some of the best and most distinct of the innumerable varieties now existing in gardens, and which have been obtained by crossing and re-crossing the several tuberous-rooted species found in the temperate regions of South America.

FIG. 235. FLOWERING BRANCH OF BEGONIA ADMIRATION.

Single-Flowered Varieties. *Crimson and Scarlet Shaded*: ADMIRATION, flowers vivid orange-scarlet, of dwarf, compact habit, and free flowering (see Fig. 235); ARTHUR G. SOAMES,* brilliant crimson scarlet, of excellent form, and very free; BALL

Begonia—*continued.*

OF FIRE,* glowing fiery-scarlet, flowers large and compact, very free; BLACK DOUGLAS,* dark carmine crimson, flowers large, of the finest form, one of the best; BRILLIANT, deep orange-scarlet, very free; CHARLES BALTET, rich velvety vermilion; COMMODORE FOOT,* brilliant velvety crimson, very free and showy; DAVISII, flowers small, dazzling scarlet, habit dwarf and free; DR. MASTERS,* flowers large, with immense spikes, deep red-crimson, very attractive; DR. SEWELL,* glowing crimson, grand form; EXONIENSIS, brilliant orange-scarlet, immense flowers; F. E. LAING, deep velvety crimson, full and free; HON. MRS. BRASSEY,* deep glowing crimson, very rich and floriferous; J. H. LAING,* brilliant scarlet, one of the freest; J. W. FERRAND,* rich vermilion, dwarf and free, one of the finest for bedding; LOTHAIR,* dark scarlet-carmine, crimson shaded, of grand form and size; MARQUIS OF BUTE, brilliant carmine-crimson, of the finest form, and immense flowers; SCARLET GEM,* very dark scarlet, flowers medium-sized, dwarf and very floriferous; SEDENI, rich rosy-crimson, dwarf, a good bedder; VESUVIUS,* bright orange-scarlet, compact and free, one of the finest bedders.

Rose-Coloured: ALBERT CROUSSÉ,* bright salmon-rose, very free; ANNIE LAING,* large and free, rich pink; CAPT. THOMPSON, rich salmon-rose, very free and compact; DELICATUM, pale flesh-rose; EXQUISITE,* rich deep rose, very free and showy; J. AUBREY CLARK, flowers very large, rich, deep; JESSIE,* soft rosy-pink, with the tips of the petals shaded carmine, a very fine, perfect variety; LADY BROOKE,* dark rose, shaded magenta, very perfect in form, and large; LADY HUME CAMPBELL,* pale pink, of good form and size, an exquisite variety; MADAME STELLA,* flowers perfect in form, large, bright rosy-pink, one of the best; MARCHIONESS OF BUTE, light rosy-pink, with an immense bloom and handsome foliage; PENELOPE,* rich salmon-rose, very free and good; PRINCESS OF WALES, very delicate pink, and free; ROSE D'AMOUR, rich rose, delicately shaded.

Begonia—*continued.*

White-Flowered: ALBA FLORIBUNDA, flowers medium-sized, very free; MOONLIGHT, very free, with good flowers and handsome foliage; MRS. LAING,* flowers exquisite in form and shape, pure white, one of the best; NYMPH,* large and round, white, tinted with rose at the base; PRINCESS BEATRICE,* flowers large, of excellent form, and pure in colour; PURITY, flowers round, good size and colour; QUEEN OF WHITES,* flowers pure white, large, most freely produced (see Fig. 236, for which we are indebted to Messrs. Veitch and Sons); REINE BLANCHE,* one of the best, very pure; SNOWFLAKE,* flowers large, in full spikes, pure white, habit compact, and very free.

Yellow and Orange-Flowered: CHROMATELLA,* habit dwarf and compact, pure yellow; EMPRESS OF INDIA, deep yellow, very showy; GEM OF YELLOWS,* rich deep yellow, of grand form and size, one of the best; GOLDEN GEM,* rich golden yellow, of excellent form and size, habit free, with prettily mottled foliage; J. L. MACFARLANE, rich orange, freest form, and large; LADY TREVOR LAWRENCE,* orange-yellow, of good form, with handsome foliage; MAUDE CHURCHILL,* pale yellow, deeper shaded, with elegant foliage; MRS. PONTIFEX,* rich orange yellow, very large flowers, copiously produced; POLLIE, pale yellow, fine round flower; SULPHUR QUEEN,* pale sulphur-yellow, of good form and size.

FIG. 236. BEGONIA QUEEN OF WHITES.

Double-Flowered Varieties. *Crimson and Scarlet Shaded*: ACHILLES, rich dark crimson, very large and free; DAVISII HYBRIDA FL.-PL.,* rich coral-red, very full and free; DAVISII FL.-PL. SUPERBA,* brilliant crimson-scarlet, of good size, and extremely free; DR. DUKE,* brilliant scarlet, very large and double, one of the best; FRANCIS BUCHNER,* rich cerise-red, very double, perfect in form, and very large; FULGURANT, rich crimson, full, with dark foliage; GLOIRE DE NANCY,* rich vermilion, very free; HERCULES,* bright orange-scarlet, very large and extremely free, habit compact and vigorous; LEMOINEI, deep orange-vermilion, very floriferous; MONSIEUR BAUER, deep red, tinged with violet;

Begonia—*continued.*

NIMROD,* rich red-scarlet, very large and full, with a free and very vigorous habit; PRESIDENT BURELLE,* glowing red, tinted with scarlet, very free; QUEEN OF DOUBLES,* rich rosy-crimson, very double and floriferous, one of the best varieties; ROBERT BURNS,* brilliant orange-scarlet, tinted vermilion, very double and free; SIR GARNET, deep orange-scarlet, very vigorous; WM. BEALBY,* deep velvety scarlet, immense size and perfect form, very free.

Rose-Coloured: ADA,* bright rosy-salmon, fringed at the edge, very full and free; COMTESSE H. DE CHOISEUL, pale rose, at first nearly white, very handsome; ESTHER,* rich rosy pink, with a distinct crimson margin; FORMOSA,* rich rosy carmine, with a white centre and crimson margin, very distinct and showy; GLORY OF STANSTEAD,* deep rose, with a well-defined white centre, very distinct and handsome; JOHN T. POE,* bright rose, tinted with cerise, of excellent form and vigorous habit; MADAME COMESSE,* rich satiny salmon-rose, immense, and most profuse; MADAME LEON SIMON, soft pale rose, very full and free; MARIE LEMOINE, light salmon with a rose centre; MRS. BRISSENDEN,* salmon-rose, with a cream-white centre, of excellent form and very free; PÆONIFLORA, flowers enormous, rich salmon-rose, very full; QUEEN OF SCOTS,* satiny-pink, salmon-shaded, of a perfect form and very large, habit compact and very free; ROSINA,* deep rose, violet shaded, of exquisite form, very vigorous and free.

White-Flowered: ANTOINETTE QUERIN,* pure white, cream, shaded centre, very large and full, a magnificent variety; BLANCHE JEANPIERRE, pure white, cream tinted, of excellent form and very free; LITTLE GEM,* pure white, of the best form and good size, habit dwarf and extremely floriferous; MRS. LUDLAM,* white, tinted with pink, a very handsome variety; PRINCESS OF WALES,* flowers very full and profuse, almost pure in colour, and immense.

Yellow-Flowered: CANARY BIRD,* flowers large, of the finest form, deep yellow, habit dwarf and very free; GABRIEL LEGROS,* pale sulphur, changing to yellow, very full and imbricated, extremely showy.

BEGONIACEÆ. An order comprising a large number of useful garden plants. The only genera are *Begonia* and *Begoniella* (which is not yet in cultivation). Flowers apetalous; perianth single; pistillate flowers having the perianth two to eight-cleft, staminate ones two to four-cleft; stamens numerous, collected into a head. Leaves alternate, stipulate. *See* **Begonia.**

BEJARIA. *See* **Befaria.**

BELLADONNA. *See* **Atropa.**

BELLADONNA LILY. *See* **Amaryllis Belladonna.**

BELLEVALIA (named in honour of P. R. Belleval, a French botanist). ORD. *Liliaceæ*. This genus is now usually placed under *Hyacinthus*. Hardy, bulbous-rooted plants, admirably adapted for spring bedding or forcing, and invaluable as cut flowers. Flowers small, whitish, or violet, tinged with green. Leaves few, radical, broadly linear. They are of extremely easy culture in ordinary garden soil. Propagated by offsets; also by seeds, which should be sown as soon as ripe.

B. operculata (lid-covered). Synonymous with *B. romana.*

B. romana (Roman).* *fl.* white, racemose; perianth campanulate; pedicels longer than the flowers. April. *l.* from 4in. to 5in. long. *h.* 6in. Italy, 1596. A most desirable plant, and the best of the genus for forcing purposes. SYNS. *B. operculata* and *Hyacinthus romanus.* (B. M. 939, under the name of *Scilla romana.*)

B. syriaca (Syrian).* *fl.* white; peduncles spreading, racemose. May. *l.* glaucous, 1ft. long, channelled, rather scarious on the margins. *h.* 1ft. Syria, 1840.

BELL-FLOWER. *See* **Campanula.**

FIG. 237. FRENCH BELL GLASS, OR CLOCHE.

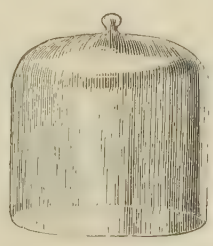


FIG. 238. ENGLISH BELL GLASS.

BELL GLASSES, or **CLOCHES.** These are used for the purpose of protecting or accelerating the growth of a plant or plants. The French Cloche (see Fig. 237) is largely employed for this purpose. Ordinary Bell Glasses (see Fig. 238) are exceedingly useful for propagating purposes, especially for hard-wooded plants; or for placing over subjects which require a very moist atmosphere, such as Filmy ferns, Cephalotus, &c.; or for covering half-hardy plants or rare alpines, and thus protecting them from excessive moisture. Large Bell Glasses, inverted, serve as miniature aquaria, and many small aquatics are easily grown in them.

BELLIDIASTRUM (from *bellis*, a daisy, and *astrum*, a star; flower-heads being star-like). ORD. *Compositæ*. A pretty dwarf, hardy, herbaceous perennial, allied to *Aster*. It thrives in a compost of loam, leaf soil, and peat. Increased by divisions in early spring, or directly after flowering.

B. Michelii (Michel's).* *fl.-heads* white; scape one-headed, naked; involucre with equal leaves; pappus simple. June. *l.* in a rosette, shortly stalked, obovate, repand. *h.* 1ft. Austria, 1570.

BELLIS (from *bellus*, pretty; in reference to the flowers). Daisy. ORD. *Compositæ*. A genus of hardy herbaceous perennials, distinguished from allied genera in having conical receptacles and an absence of pappus. They grow well in all loamy soils. The garden varieties are increased by division after flowering, each crown making a separate plant. The soil must be pressed about them moderately firm. Seeds may also be sown in March, but the plants thus obtained are seldom of sufficient floricultural merit to perpetuate.

FIG. 239. BELLIS PERENNIS FLORE-PLENO.

B. perennis (perennial).* Common Daisy. *fl.-heads* white. June. *l.* numerous, lying flat on the ground, obovate, crenate, slightly hairy, tapering at the base. *h.* 3in. England. The varieties are very numerous, the double ones being particularly fine. See Fig. 239. The handsome variegated form, *aucubæfolia*, has its

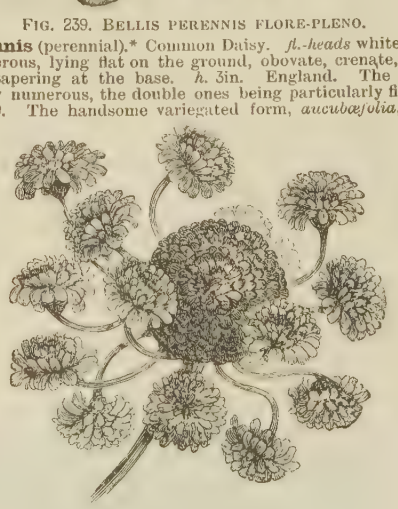


FIG. 240. HEN AND CHICKENS DAISY (BELLIS PERENNIS PROLIFERA).

leaves richly stained and veined with yellow. There are both red and white-flowered forms of this variety. The Hen and Chickens Daisy is a proliferous form, rather more quaint than

Bellis—*continued.*

pretty. See Fig. 240. Good garden kinds are *B. p. conspicua*, red; CROWN, pink; ELIZA, purple; RUBENS, red; SNOWFLAKE, white.

FIG. 241. BELLIS ROTUNDIFOLIA CŒRULESCENS.

B. rotundifolia cœrulescens (round-leaved, bluish).* *fl.-heads* from ¾in. to 1¼in. in diameter, resembling those of the common Daisy, but with fewer, often broader, ray-flowers, which vary from white to pale blue. *l.* more or less hairy, with slender stalks, 1in. to 3in. long; blade ovate or sub-cordate, sinuate toothed, three-nerved. Morocco, 1872. A very beautiful perennial, requiring the shelter of a cold frame during severe winters. See Fig. 241. (B. M. 6015.)

BELLIUM (from *bellis*, a Daisy; the flowers resembling those of that plant). ORD. *Compositæ*. A genus of pretty little, free-flowering plants, differing from the common Daisy only in having a pappus of six to eight broad scales, torn at the apex, alternating with a like number of long scabrous bristles. They thrive best in a mixture of sandy loam and peat. Propagation is readily effected by means of seeds or divisions; the latter should be made in spring.

FIG. 242. BELLIUM BELLIDIOIDES.

Bellium—*continued.*

B. bellidioides (Daisy-like).* *fl.-heads* white, solitary. June to September. *l.* spathulate, radical. Stolons creeping. *h.* 4in. Italy, 1796. Annual. See Fig. 242.

B. crassifolium (thick-leaved). *fl.-heads* whitish-yellow; scapes much exceeding the leaves, downy. June. *l.* sub-radical, thick, obovate, entire, attenuate at base, rather downy. Stems many, ascending. *h.* 6in. Sardinia, 1831. Hardy perennial. (S. B. F. G. 2, 278.)

B. minutum (very small).* *fl.-heads* white and yellow, ¼in. across, on slender stalks, longer than the foliage. June to September. *l.* narrow spathulate, attenuated at the base, slightly hairy. *h.* 3in. Levant, 1772. A rare little species, requiring a warm, well-drained position on the rockery

BELLOWS. These were formerly employed for fumigating, but are now entirely superseded by the ordinary fumigators. The Sulphur Bellows is a very useful instrument for the uniform distribution of flowers of sulphur on vines and other subjects infested with mildew. In form it is very like those in common domestic use, but has a rose of small holes at the end of its nozzle, through which the sulphur is ejected.

BELL-PEPPER. *See* **Capsicum grossum.**

BELOPERONE (from *belos*, an arrow, and *peronne*, a band; in reference to the arrow-shaped connectivum). SYN. *Dianthera*. ORD. *Acanthaceæ*. Very pretty stove evergreen shrubs, allied to *Justicia*. Flowers blue or purple, borne in secund, axillary, or terminal spikes, frequently subtended with coloured bracts; corolla gaping, the upper lip concave, the lower trifid. They are easily cultivated in a compost of loam, leaf soil, peat, and sand. Propagated by young cuttings, taken in spring. Beloperones may also be treated like *Justicias* (which *see*), and will succeed admirably. There are a large number of species, but few of which have been introduced.

B. oblongata (oblong). *fl.* rosy-purple; spikes axillary; anthers calcarate at base; bracts bracteolate. Summer. *l.* oblong-lanceolate, opposite. *h.* 3ft. Brazil, 1832. (B. H. 9, 9.)

B. violacea (violet-coloured).* *fl.* violet. *l.* lanceolate, acuminate, entire. *h.* 3ft. New Grenada, 1859. (B. M. 5244.)

BENDING-DOWN the branches of fruit trees, by means of weights or string attached to pegs driven into the ground, is sometimes resorted to for the purpose of acquiring a particular shape, or fruitfulness; but authorities differ as to the usefulness of the plan for the latter purpose. Young trees that are inclined to grow strong in the middle may be more evenly balanced by adopting the plan of Bending the strong branches, and so diverting the sap to the weaker ones.

BENGAL QUINCE. *See* **Ægle Marmelos.**

BENJAMIN-TREE. *See* **Ficus Benjamina.**

BENT GRASS. *See* **Agrostis.**

BENTHAMIA (in honour of George Bentham, a distinguished English botanist). ORD. *Cornaceæ*. Hardy evergreen shrubs or low trees, now referred to the genus *Cornus*. The first-named species is rather tender in the neighbourhood of London, and can only be grown successfully against a wall, for which purpose it is very suitable. In Cornwall and other mild places, it attains a height of 20ft. in the open. Loudon thinks it might be rendered hardier by grafting it on *Cornus sanguinea*. Flowers disposed in heads, each head attended by an involucre, which consists of four petal-like parts, and resembles a corolla; calyx with a minute four-toothed limb; petals four, fleshy, wedge-shaped; stamens four; style one. Leaves opposite, exstipulate, sub-evergreen, entire. Fruit constituted of many pomes grown together. They thrive in rather moist, loamy soil, in a sheltered spot. Propagated by seeds, sown when ripe, in a cool-house; or by layering, in autumn.

B. fragifera (Strawberry-flowered).* *fl.* large, white, sessile, densely aggregate, forming a round head. June to October. *fr.* large, about the size of that of the common Arbutus, reddish. *l.* lanceolate, acuminated at both ends, on short petioles, rather rough, with small, adpressed down. Branches spreading, smooth. *h.* 10ft. to 15ft. Nepaul, 1825. (G. C. xiv., 728.)

B. japonica (Japanese). *fl.* yellowish-red. Spring. *h.* 8ft. Japan, 1847. (S. Z. F. J. 16.)

BERARDIA (named after M. Berard, a Professor of Chemistry at Montpelier). ORD. *Compositæ*. A genus containing a single species, confined to the high mountains of Western Europe. It makes a pretty rock plant, and grows best in thoroughly well-drained spots amongst rocky *débris*. Propagated by seeds, sown in spring.

B. subacaulis (almost stemless). *fl.-heads* whitish, solitary, very large. *l.* rounded oval, nearly heart-shaped at base, cottony. *h.* 3in. or 4in. (A. F. P. 3, 38.)

BERBERIDEÆ. An order of shrubs or herbaceous perennials. Flowers terminal or axillary, usually racemose; sepals three, four, or six in a double row; petals as many or double in number; stamens four to eight, opposite the petals. Fruit, a berry or capsule. Leaves alternate, compound. The order contributes a great number of handsome plants to our gardens. Well-known genera are *Berberis*, *Epimedium*, and *Nandina*.

BERBERIDOPSIS (from *Berberis*, the Barberry, and *opsis*, like; resembling the Barberry). ORD. *Berberideæ*. A handsome evergreen shrub, with climbing habit. Sepals and petals nine to fifteen; outer small, spreading; intermediate orbicular, concave; inner obovate-cuneate, erect, inserted upon the fleshy torus. Stamens eight to nine, free. With a slight winter protection, or planted at the foot of a south wall, it will prove quite hardy, being of easy culture in ordinary garden soil. It is an excellent plant for the cool greenhouse. Increased by seeds, which should be sown in spring; by layering, in autumn; or by young cuttings, in spring.

FIG. 243. FLOWERING BRANCHES OF BERBERIDOPSIS CORALLINA.

B. corallina (coral-red).* *fl.* crimson, in terminal, drooping racemes, leafy at the base. *l.* about 3in. long, alternate, simple, petiolate, oblong-cordate, obtuse or acute, spiny-toothed. Chili, 1862. See Fig. 243. (B. M. 5343.)

BERBERIS (*Berbery*s is the Arabic name of the fruit, signifying a shell; many authors believe this to be the original derivation of the word, because the leaves are hollow, like a shell). Barberry. ORD. *Berberideæ*. Including *Mahonia*. A genus of hardy erect or trailing shrubs. Flowers yellow or orange, racemose or fascicled; sepals and petals similar, in two series. Leaves simple or compound, alternate or fascicled from the non-development of the branches, often spinose, or reduced to spines. The common sorts thrive well in any ordinary garden soil, but the rarer kinds require a compost of loam, peat, and a little sand. Propagation may be effected by suckers or layers, put down in the autumn; by ripened cuttings, taken at the same time, and planted in sandy soil, in a cold frame; or by seeds, sown in the spring, or, preferably, in the autumn, when, if fresh from the pulp or berry, they will germinate in the open in the following spring. The last-named is the method generally adopted.

B. Aquifolium (Holly-leaved).* *fl.* yellow; racemes nearly erect, much crowded. Spring. *l.*, leaflets two or three pairs, with an odd one, the lower part distant from the petiole; ovate, approximate, cordate at the base, one-nerved, spiny-toothed. *h.* 5ft. to 6ft. North America, 1823. This is extensively planted in woodlands as an excellent covert plant. SYN. *Mahonia aquifolia*. (S. E. B. 49.)

B. aristata (bearded). *fl.* yellow; racemes nodding, many-flowered, longer than the leaves; pedicels trifid, three-flowered. Spring. *l.* obovate-oblong or lanceolate, mucronate, membranous, smooth, serrated with four or five spinulose teeth; lower spines three-parted, upper ones simple, and hardly bidentate at the base. *h.* 6ft. Nepaul, 1820. (B. R. 729, under name of *B. Chitria*.)

B. asiatica (Asiatic). *fl.*, racemes short, many-flowered, corymbose, shorter than the leaves; pedicels elongated, one-flowered. *l.* oval, cuneated, or elliptical, mucronate, smooth; under surface glaucous, entire, or spinulosely-toothed; spines trifid, or simple. *h.* 4ft. to 8ft. 1820. Half-hardy.

B. buxifolia (Box-leaved).* *fl.* solitary, on slender peduncles. Spring. *l.* nearly sessile, oval or oblong, about ½in. long, entire. *h.* 8ft. Straits of Magellan, 1830. *nana* is a charming little variety, not exceeding 18in. in height. SYN. *B. dulcis*. (B. M. 6505.)

B. canadensis (Canadian).* *fl.*, racemes many-flowered, nodding. Spring. *l.* obovate-oblong, remotely serrated; upper ones nearly entire; spines three-parted. *h.* 4ft. Canada, 1759.

B. cratægina (Hawthorn-like). *fl.*, racemes many-flowered, crowded, spreading, scarcely longer than the leaves. Spring. *l.* oblong, reticulated, hardly serrated; spines simple. *h.* 4ft. to 8ft. Asia Minor, 1829.

B. cretica (Cretan). *f.*, racemes three to eight-flowered, rather shorter than the leaves. Spring. *l.* oblong-oval, entire, or somewhat serrated; spines three to five-parted. *h.* 4ft. to 5ft. Crete and Cyprus, 1759. The variety *serratifolia* has leaves ciliately-serrated. (S. F. G. 342.)

B. Darwinii (Darwin's).* *fl.* orange, racemose, very numerous. May, and sometimes again in autumn. *l.* oval or oblong, about 1in. long, with usually five spiny teeth. *h.* 2ft. South Chili, 1849. This very fine species is, perhaps, the best; it forms a densely-branched, spreading, evergreen bush, thus making an excellent covert plant. (B. M. 4590.)

B. dulcis (sweet). Synonymous with *B. buxifolia*.

B. emarginata (emarginate). *fl.*, racemes scarcely pendulous, shorter than the leaves. Spring. *l.* lanceolate-obovate, ciliately serrated; spines three-parted. *h.* 6ft. Siberia, 1790.

B. empetrifolia (Empetrum-leaved).* *fl.* few, terminal, sub-umbellate, on slender pedicels. May. *l.* in fascicles of about seven, linear, closely revolute, sharply mucronate. *h.* 1½ft. to 2ft. Straits of Magellan, 1827. (B. R. 26, 27.)

B. fascicularis (fascicled). *fl.*, racemes erect, much crowded. Spring. *l.*, leaflets three to six pairs, with an odd one, the lower pair distant from the base of the petiole; ovate-lanceolate, rather distant, one-nerved, spiny toothed, with four to five teeth on each side. *h.* 6ft. to 8ft. New Spain, 1820. Hardy. SYN. *Mahonia fascicularis*. (B. M. 2396.)

B. floribunda (many-flowered).* *fl.*, racemes many-flowered, loose, solitary, pendulous. June. *l.* obovate-lanceolate, or obovate-oblong, tapering much towards the base, ending in a

Berberis—*continued.*

mucrone at the apex, paler beneath, spiny-ciliated; spines three-parted, unequal. *h.* 10ft. Nepaul. A variety of *aristata*.

B. Fortunei (Fortune's).* *fl.* small, in terminal clustered racemes. *l.*, leaflets about seven, linear-lanceolate, distant, with numerous small spiny teeth, lower pair remote from the base of the petiole. China.

B. glumacea (glumaceous). A synonym of *B. nervosa*.

B. iberica (Iberian). *fl.*, racemes many-flowered, pendulous. Spring. *l.* obovate-oblong, quite entire; spines simple and three-parted. *h.* 8ft. to 10ft. Iberia, 1818.

B. ilicifolia (Holly-leaved). *fl.*, peduncles short, four-flowered; pedicels elongated, somewhat corymbose. July. *l.* ovate, tapering at the base, coarsely and spinulosely toothed; spines three-parted. *h.* 2ft. to 3ft. Tierra del Fuego, 1791. (B. M. 4308.)

B. japonica (Japanese).* *fl.*, racemes in terminal clusters. Spring. *l.*, leaflets usually nine, about 3in. long, quite sessile, broadly cordate, or rotundate at the base, oblique, with about five long spiny teeth, and a terminal one, the lowest pairs close to the base of the petiole. China and Japan. Very distinct, with unbranched stems and leaves about 1ft. long. *B. Beali* and *B. intermedia* are mere forms of this species, the latter differing from it in having narrower leaves and longer, slender racemes. (B. M. 4852).

B. loxensis (Loxanese). *fl.* unusually small, erect, in panicled racemes on a long peduncle quite clear of the leaves. *l.* very shining, blunt, obovate; sides often with several teeth; spines small, palmated. *h.* 3ft. to 4ft. Peru. Evergreen, not hardy. (P. F. G. 1, p. 13)

FIG. 244. BERBERIS NEPALENSIS.

B. nepalensis (Nepaulese).* *fl.* yellow; racemes few, elongated, slender. *l.* 1ft. to 2ft. long; leaflets five to nine pairs, obovate-oblong, cuspidate, rounded at the base, repand-toothed, with five to ten spiny teeth on each side, tricuspidate at the apex. *h.* 4ft. to 6ft. Nepaul. A very handsome species, thriving best in the southern parts of England. SYN. *Mahonia nepalensis*. See Fig. 244.

B. nervosa (large-nerved). *fl.*, racemes elongated. October. *l.*, leaflets five to six pairs, with an odd one, the lower pair distant from the petiole; ovate, acuminated, remotely spiny toothed, somewhat three to five-nerved, with twelve to fourteen teeth on each side. *h.* 1ft. to 3ft. North America, 1826. SYNS. *B. glumacea*, *Mahonia nervosa*. (B. M. 3949.)

B. repens (creeping).* *fl.*, racemes terminal, numerous, fascicled, diffuse, rising from the scaly buds. Spring. *l.*, leaflets, two to three pairs, with an odd one, roundish-ovate, opaque, spiny toothed. *h.* 1ft. to 2ft. North America, 1822. SYN. *Mahonia repens*. (B. R. 1176.)

B. ruscifolia (Ruscus-leaved). *fl.* a little larger than those of *B. vulgaris*; peduncles short, bearing four to five flowers at the apex. *l.* oblong, tapering at the base, mucronate, entire, or

Berberis—*continued.*

grossly and spiny toothed. *h.* 4ft. to 8ft. South America, 1823. Half-hardy.

B. sinensis (Chinese).* *fl.*, racemes many-flowered, nodding. May. *l.* oblong, obtuse, entire, or the lower ones are a little toothed; spines three-parted. *h.* 3ft. to 6ft. China, 1815. (B. M. 6573.)

FIG. 245. BERBERIS STENOPHYLLA, showing Habit and Flowering Twig.

B. stenophylla (naked-leaved),* with narrow mucronate leaves, is said to be a hybrid between *B. empetrifolia* and *B. Darwinii*. See Fig. 245.

B. trifoliata (three-leafleted). *fl.*, racemes small, axillary, sessile, three to five-flowered. Spring. *l.*, leaflets three, sessile at the ends of the petioles, deeply scalloped, bluish-green, variegated, glaucous beneath. *h.* 5ft. Mexico, 1839. Evergreen, not quite hardy. (P. F. G. 2, 168.)

B. trifurcata (three-forked). *fl.*, racemes compound, erect. Spring. *l.* pinnate; leaflets broad, three-forked. *h.* 6ft. China, 1850. Evergreen. (P. F. G. 3, 258.)

B. umbellata (umbellate). *fl.*, peduncles solitary, erect, bearing at the top several umbellate pedicels. *l.* obovate-oblong, mucronate, entire, glaucous beneath; spines three-parted, long, equal. *h.* 6ft. Nepaul, 1842. (P. F. G. 2, 181.)

B. vulgaris (common).* Common Barberry. *fl.*, racemes many-flowered, pendulous. Spring. *l.* somewhat obovate, ciliately-serrated; spines three-parted. *h.* 8ft. to 20ft. Britain, &c. There are yellow, violet, purple, black, and white fruited, and purple-leaved forms. (Sy. En. B. 51.)

B. Wallichiana (Wallich's).* *fl.* on drooping, aggregated peduncles, six to eight or more in a cluster. Spring. *l.* in alternate fascicles, 2in. to 3in. long, spreading or recurved, lanceolate, sinuato-serrate; spines deeply three-parted, slender but rigid. *h.* 6ft. to 10ft. Nepaul, 1820. See Fig. 246. (B. M. 4656.)

BERCHEMIA (in honour of M. Berchem, a French botanist). ORD. *Rhamneæ*. A genus of erect, or twining, deciduous, mostly greenhouse shrubs. Flowers sub-umbellate, in the axils of the upper leaves, or disposed in terminal panicles. Leaves alternate, many-nerved, entire. The species mentioned below is probably the only one yet in cultivation. It is quite hardy, will grow in any common soil, and is well adapted for bowers or trellis-work. Propagated by ripened cuttings, or by slips of the root, planted under a hand glass; or by layering the young shoots.

B. volubilis (twining).* *fl.* greenish-white; panicles small, axillary and terminal. Drupe oblong, violaceous. June. *l.* oval, mucronate, a little wavy. Branches smooth. Carolina, 1714. A deciduous twiner. (G. G. 165.)

BERGAMOT. *See* **Mentha odorata.**

BERGERA (named after C. J. Berger, a distinguished Danish botanist). ORD. *Rutaceæ*. Interesting stove evergreen trees, now usually referred to *Murraya*. Leaves impari-pinnate; leaflets alternate, acuminated, pubescent. They thrive in a mixture of turfy loam and peat. Propagated by ripened cuttings, taken off at a joint, and placed in sand, under a hand glass, in bottom heat; or by layers.

Bergera—*continued.*

B. Kœnigi (Kœnig's). *fl.* whitish-yellow, small; racemes many, forming a corymb at the top of the branches. June. *l.*, leaflets serrated. *h.* 40ft. India, 1820. (L. B. C. 1019.)

BERKHEYA (named after M. J. L. de Berkhey, a Dutch botanist). ORD. *Compositæ*. A genus of ornamental greenhouse or hardy thistle-like herbs or shrubs. Flower-heads surrounded by a spiny involucre, the scales of which are united at the base only; pappus of many flat, obtuse or pointed scales. They are of easy cultivation in a sandy loam soil. The shrubs are increased by cuttings,

FIG. 246. BERBERIS WALLICHIANA.

Berkheya—*continued.*

placed under a glass; the herbaceous perennials usually by divisions of the plant in spring. The species most frequently seen in English gardens is *B. purpurea*.

B. grandiflora (large-flowered).* *fl.-heads* yellow; scales of involucre spiny toothed. July. *l.* opposite, lanceolate, three-nerved, spiny toothed, downy beneath. *h.* 2ft. Cape of Good Hope, 1812. Greenhouse evergreen. (B. M. 1844.)

B. pinnata (pinnate). *fl.-heads* yellow; involucral scales spine-pointed, entire or toothed. Autumn. *l.* oblong, woolly beneath, deeply cut into lance-shaped segments. SYN. *Stobæa pinnata*. (B. M. 1788.)

B. purpurea (purplish).* *fl.-heads* numerous, pedunculate, corymbose, circular, 3in. across, surrounded by an involucre of spreading or reflexed linear oblong bracts. *l.*, lower ones 15in. to 18in. long, 2in. to 2½in. wide, dark green, viscid above, paler and cottony beneath. *h.* 3ft. South Africa. A very handsome, hardy, herbaceous perennial. (G. C. 1872, p. 1261.) SYN. *Stobæa purpurea*.

B. uniflora (one-flowered). *fl.-heads* yellow; scales of involucre spiny toothed. June. *l.* alternate, lanceolate, three-nerved, spiny toothed, downy beneath. *h.* 3ft. Cape of Good Hope, 1815. Greenhouse evergreen. (B. M. 2094.)

BERMUDA CEDAR. *See* **Juniperus bermudiana.**

BERRY. A fleshy fruit, containing seeds.

BERTHOLLETIA (in honour of Louis Claude Berthollet, a celebrated French chemist). Brazil Nut Tree.

Bertholletia—*continued.*

TRIBE *Lecythideæ* of ORD. *Myrtaceæ*. *B. excelsa* is a tall tree, having the young branches leafy at the apex. Leaves alternate, oblong, quite entire, rather coriaceous. From this Brazilian species are obtained the well-known Brazil or Para Nuts of commerce. The tree is of no value for decorative purposes.

BERTOLONIA (named after A. Bertoloni, an Italian botanist, author of "Rariorum Italiæ Plantarum Decades," &c.). ORD. *Melastomaceæ*. Elegant little creeping or dwarf-growing stove plants, chiefly cultivated for their exquisitely marked leaves. Flowers white or purple. Leaves stalked, ovate-cordate, five to eleven-nerved, crenulated; cymes corymbose, terminal. They thrive in a compost of equal parts peat, leaf mould, and sand, in a warm, close, and moist atmosphere, but are most successfully cultivated under a bell glass in the stove; in fact, the latter is the only plan of growing them where a constantly humid atmosphere cannot be otherwise obtained without such means. They are easily propagated by cuttings or seeds.

B. ænea (coppery). *fl.* purple. *h.* 6in. Brazil.

B. guttata (spotted). *See* **Gravesia.**

B. maculata (spotted).* *fl.* violet-purple; peduncles axillary, bearing at the apex a short raceme of six to seven flowers. *l.* on long petioles, cordate, ovate, quite entire, pilose on both surfaces and on the margins, five-nerved. Branches, petioles, peduncles, and calyces hispid from long bristles. Stem rooting at the base. Brazil, 1850. (B. M. 4551.)

B. marmorata (marbled).* *l.* 5in. to 8in. long, ovate-oblong, hairy, five-nerved; upper side vivid bright green, beautifully marked with irregular streaks of pure white; under surface of a uniform rich purple. Stem fleshy. *h.* 6in. Brazil, 1858.

B. pubescens (downy).* *l.* ovate-acuminate, 3in. to 4in. long, and 2in. to 3in. broad; bright light green, with a broad chocolate-coloured band down the centre; upper surface clothed with long white hairs. Ecuador.

BERZELIA (named in honour of Berzelius, a celebrated Swedish chemist). ORD. *Bruniaceæ*. Very pretty little greenhouse evergreen shrubs. Heads of flowers naked, with three bracts at the base of each; usually crowded at the tops of the branches. Leaves short, somewhat trigonal, imbricate or spreading. They require a mixture of peat, loam, and sand, with thorough drainage and moderately firm potting. Young cuttings root freely in sand, under a bell glass, in gentle heat.

B. abrotanoides (Abrotanum-like). *fl.-heads* white, the size of a filbert, terminal, crowded, sub-corymbose; bracts clavate, green, smooth, ustulate at the apex. May to July. *l.* ovate, ustulate at the apex, smooth, spreading, on short petioles. *h.* 1½ft. Cape of Good Hope, 1787. (L. B. C. 355.)

B. lanuginosa (woolly).* *fl.-heads* white, about the size of a pea, at the tops of lateral branches, disposed in a fastigiate panicle; bracts spathulate, callose at the apex. June to August. *l.* triquetrous, spreading, callose at the apex, rather hairy. Branches erect, villous when young. *h.* 1ft. to 2ft. Cape of Good Hope, 1774. (L. B. C. 572.)

BESCHORNERIA (in honour of H. Beschorner, a German botanist). ORD. *Amaryllideæ*. Greenhouse evergreen succulents, allied to *Littæa* and *Feurcræa*. Perianth deeply six-parted; segments linear spathulate, tubulose-connivent, often spreading at the point; stamens six, about as long as the perianth. For culture, &c., *see* **Agave** and **Aloe.**

B. bracteata (bracteate). *fl.* at first green, turning yellowish-red when mature; panicle 2ft. to 3ft. long; branches many-flowered and corymbose, subtended by large scariose reddish bracts. *l.* in a dense rosette, 12in. to 18in. long, thin, glaucous green with scabrous margin. *h.* 5ft. to 6ft. Mexico. See Fig. 247. (B. M. 6641.)

B. Decosteriana (Decoster's). *fl.* green, tinged with red, pendulous, bracteate; panicle 2ft. to 3ft. long, inclined, with numerous bracts. *l.* numerous, spreading, 18in. to 24in. long, by 1in. to 1½in. broad; edges minutely serrulate. *h.* 8ft. Mexico, about 1880.

B. Tonelii (Tonel's).* *fl.* tubular, 2½in. long, drooping, pedicellate, dark blood-red below and down the centre, the rest very bright verdigris green; panicle 2ft. long, slender, inclined; bracts several to each fascicle of flowers; scape 4ft. high, red-purple, *l.* few, spreading, 15in. to 20in. long, by 2½in. broad, acuminate and keeled beneath towards the top, minutely serrulate. Mexico, 1872. (B. M. 6091.)

Beschorneria—*continued.*

FIG. 247. BESCHORNERIA BRACTEATA.

B. tubiflora (tube-flowered). *fl.* greenish-purple, nutant, fascicled, bracteate; fascicles remote, secund; scapes erect, long, simple. May. *l.* radical, linear, channelled, recurved, spinosely denticulate. *h.* 6ft. Mexico, 1845. (B. M. 4642.)

B. yuccoides (Yucca-like). *fl.* bright green, pendent, racemose, with rich rosy-red bracts; scapes slender, coral-red, simple. May and June. *l.* radical, thickish, lanceolate, acute, 1ft. to 1½ft. long. *h.* 4ft. Mexico.

BESLERIA (named in honour of Basil Besler, an apothecary at Nuremberg). SYN. *Eriphia*. ORD. *Gesneraceæ*. Very pretty stove sub-shrubs, usually erect, branched. Peduncles axillary, few-flowered. Leaves opposite, petiolate, thickish; nerves and veins very prominent beneath. Stems sub-tetragonal. A light rich earth, or a mixture of sand, loam, and peat, and a moist atmosphere, are necessary for successful cultivation. Beslerias may be increased by cuttings, which root readily in heat.

B. coccinea (scarlet-berried).* *fl.* yellow; peduncles axillary, bearing three to six flowers in an umbel at top; bracts two, at the division of the common peduncle, orbicularly cordate, toothed, scarlet. *l.* ovate, glabrous, stiff, a little toothed. Guiana, 1819. Climbing shrub. (A. G. 255.)

B. cristata (crested). *fl.*, corolla yellowish, hairy outside; peduncles axillary, solitary, one-flowered; bracts cordate, toothed, sessile, scarlet. June. *l.* ovate, serrated. Guiana, 1739. Climbing shrub.

B. grandiflora (large-flowered).* *fl.* large, campanulate, spotted with red; peduncles axillary, elongated, many-flowered. *l.* ovate-oblong, acuminated, crenated, densely pilose above, villous beneath, as well as on the branches. *h.* 3ft. Brazil.

B. Imrayi (Imray's). *fl.* rather small, yellow, in axillary whorls. *l.* large, lanceolate, serrate, glabrous. Stems quadrangular. Dominica, 1862. Herbaceous perennial. (B. M. 6341.)

Besleria—*continued.*

B. incarnata (flesh-coloured-berried).* *fl.*, corollas purplish; tube very long, ventricose; lobes of limb reflexed, roundish, unequal, fringed; peduncles axillary, solitary, one-flowered. *l.* oblong, crenated, tomentose on both surfaces. *h.* 2ft. Guiana, 1820. Herbaceous perennial.

B. violacea (purple-berried). *fl.* purple, small; corolla with a curved tube and spreading limb; peduncles racemosely panicled, terminal. Berry purple, edible. *l.* ovate, acute, quite entire, stiff. Guiana, 1824. Climbing shrub. (A. G. 254.)

BESOM, or **BROOM**. Birch-brooms are best for garden purposes, and are generally used. The most suitable for paved yards are those made of the common Ling (*Calluna vulgaris*). Those made of bass fibres are frequently used on paths, for which they are very suitable, but their expensiveness prevents them being generally employed. Whatever material is used in its composition, a Besom will last much longer if soaked in water for some time before using.

BESSERA (in honour of Dr. Besser, Professor of Botany at Brody). ORD. *Liliaceæ*. An elegant little half-hardy, Squill-like, bulbous plant, from Mexico. Perianth bell-shaped, six-parted. Leaves narrow, linear. It requires a compost of loam, leaf soil, peat, and sand, with good drainage. If cultivated in pots, a plentiful supply of water must be given from the commencement of growth until ripening off. When at rest, however, it should be kept dry and cool, but secure from the effects of frost. If planted out, a well-drained sunny position must be chosen, such as close to the wall of a greenhouse with a southern aspect. Propagation may be effected by offsets.

B. elegans (elegant).* *fl.* scarlet, or scarlet and white. July to September. *l.* 1ft. to 2ft. long, narrow, furrowed on the upper side. *h.* 2ft. Mexico, 1850. This is the only species. The colour of the flowers varies considerably, on which account other names have originated. (B. R. 25, 34.)

BETA (from *bett*, the Celtic word for red; in reference to the colour of the Beet). Beetroot. ORD. *Chenopodiaceæ*. Perianth single, half-inferior, five-cleft, persistent. Seed one, reniform, imbedded in the fleshy base of the calyx. *B. Cicla* is largely used as a decorative plant in sub-tropical and other styles of gardening. They require the same culture as the ordinary Beet. The other sorts, with dark blood-red leaves, are largely employed in flower gardens, and the roots utilised for culinary purposes. *See also* **Beet.**

FIG. 248. BETA HORTENSIS METALLICA, or VICTORIA BEET.

B. Cicla (Sicilian). *fl.* greenish, disposed in threes. August. *l.* with very thick ribs. Roots scarcely any. *h.* 6ft. Portugal, 1570.

Beta—*continued.*

The variety, *B. c. variegata*, usually known as the Chilian Beet, is a very handsome plant, having its leaves often more than a yard in length and over 1ft. in diameter, with a remarkably handsome variegation. The midribs are usually dark orange or scarlet. It is a most desirable and effective plant for sub-tropical gardening.

B. hortensis metallica (metallic). Victoria Beet. An ornamental variety with glistening deep blood-red leaves. Useful for decorative purposes in summer, either as a single specimen or in a mass. Roots may also be used for cooking. See Fig. 248.

B. maritima (sea). *fl.* greenish, disposed in hairs. August. *l.*, lower ones rhomboid-ovoid, acute; upper ones lanceolate. Stem diffuse. Root scarcely any. *h.* 1ft. Britain.

B. vulgaris (common). The Common Beetroot. *fl.* greenish, clustered. August. *l.*, lower ones ovate. Root fleshy. *h.* 4ft. South Europe, 1548.

BETCKEA. *See* **Plectritis.**

BETEL, or **BETLE.** *See* **Piper Betle.**

BETONICA. This genus now forms a sub-division of **Stachys** (which *see*). Betony (*Stachys Betonica*) is a native herb formerly much used in medicine, but now almost entirely discarded.

BETONY. *See* **Stachys Betonica.**

BETULA (according to some authorities, from *Betu*, its Celtic name; others give the derivation of the word as from *batuo*, to beat, the fasces of the Roman lictors, which were made of Birch rods, being used to drive back the people). Birch. ORD. *Cupuliferæ*. TRIBE *Betuleæ*. Ornamental, hardy (except where otherwise specified), deciduous trees or shrubs, allied to *Alnus*, having round, slender, often drooping branches, and the bark in most species in thin membranous layers. The flowers appear at the same time as the leaves. Male catkins cylindrical, lax, imbricated all round with ternate concave scales, the middle one largest, ovate; corolla none; filaments ten to twelve, shorter than the middle scale, to which they are attached. Female catkins similar, but more dense; scales horizontal, peltate, dilated outwards, three-lobed, three-flowered; corolla none. Nut oblong, deciduous, winged at each side. The Betulas are easily cultivated in any ordinary soil; but a light sandy loam suits them best. Most of the species are best increased by seeds, which ripen in September, and need to be dried, in order to prevent fermentation. They should be sown in March, in a sandy soil, the surface of which has been previously made perfectly level. They must be spread on the surface, and not covered with soil, but pressed down with the feet. When grown in quantities, beds 4ft. in width are preferred, with an alley of 1ft. between them. In early summer, if the weather be warm and dry, the beds should be shaded with branches. The young seedlings must be transplanted when a year old. The dwarfer kinds may be propagated by layering in the autumn. The numerous beautiful varieties are best increased by grafting or budding upon seedling stocks of the common kinds, the former being done in spring, and the latter in summer when the buds are ready. Those most useful as forest trees and for protection are quick-growing and very ornamental. The time of maturity of the Birch depends very much upon the soil and situation, but it seldom increases in size after it is thirty years old. The common species (*B. alba*) is one of the hardiest and most useful trees in cultivation, growing quickly, and withstanding exposure better than

Betula—*continued.*

many others; consequently it is invaluable for skirting and nursing more tender subjects, and is especially desirable for clothing mountainous and exposed districts. It is also very beautiful and picturesque. It is the commonest tree throughout Russia, from the Baltic to the Eastern Sea, frequently monopolising gigantic forests. In Italy, it forms excellent forests up to 6000ft. altitude, and in our own Highlands of Scotland it occurs up to a height of 2500ft. In Greenland, although much reduced in size, it holds its own as the only arboreal vegetation.

FIG. 249. LEAVES AND CATKIN OF BETULA ALBA.

B. alba (white).* Silver, White, or Common Birch. *fl.* whitish. February and March. *fr.* brown, ripe in September and October. *l.* ovate, acute, somewhat deltoid, unequally serrated; autumnal tints rich yellow, scarlet, or red. A diminutive shrub in the extreme north, but a tree from 50ft. to 60ft. high in the middle regions. Britain. A most beautiful and invaluable forest tree, with a large number of varieties. See Fig. 249.

B. a. alba-purpurea (white and purple).* *l.* rich purple above, with a lustrous metallic hue, pale beneath. Branches with a sub-pendulous disposition. A very effective variety.

B. a. dalecarlica (Dalecarlian).* *l.* deeply pinnatifid, with the lobes toothed.

B. a. foliis-variegatis (variegated-leaved).* *l.* blotched with yellowish white.

B. a. laciniata pendula (pendulous and laciniate).* *l.* rather larger than the typical form, deeply laciniated, deep green, and decidedly pendulous. It appears there are two forms of this, but that known as Young's variety is the best.

B. a. macrocarpa (large-fruited).* Female catkins twice as long as those of the type.

B. a. pendula (pendulous).* A well-known tree, distinct from the species in having the shoots more slender, smoother, and pendulous.

B. a. pontica (pontic). *l.* somewhat larger than in the species, and the plant of more robust growth. (W. D. B. 2, 94.)

B. a. pubescens (downy). *l.* covered with hairs.

B. a. urticifolia (nettle-leaved).* *l.* deeply laciniated, serrated, and hairy. Several others, reputed as distinct, are mere forms of the typical *B. alba.*

B. Bhojpattra (Bhojpattra).* *fl.*, female catkins erect, cylindrical, oblong; bracts smooth, woody, two-parted, blunt, much

Betula—*continued.*

longer than the fruit, which has narrow wings. May. *l.* oblong-acute, with nearly simple serratures, somewhat cordate at the base; their stalks, veins, and twigs hairy; the bark is of a pale cinnamon colour. *h.* 50ft. Himalayas, 1840. This requires a sheltered position.

B. carpinifolia (Hornbeam-leaved). Synonymous with *B. lenta.*

B. daurica (Daurian).* *fl.*, catkins whitish-brown, larger than those of the common Birch. February and March. *l.* ovate, narrow at the base, quite entire, unequally dentate, glabrous; scales of the strobiles ciliated on their margins; side lobes roundish. *h.* 30ft. to 40ft. Siberia, 1786. The variety *parvifolia* has smaller leaves than the type.

B. excelsa (tall). Synonymous with *B. lutea.*

B. fruticosa (shrubby).* *fl.* whitish-brown; female catkins oblong. February and March. *l.* roundish-ovate, nearly equally serrated, glabrous. *h.* 5ft. to 6ft. in moist situations, but much higher on mountains. Eastern Siberia, 1818. (W. D. B. 2, 154.)

B. glandulosa (glandular).* *fl.* whitish; female catkins oblong. May. *l.* obovate, serrate, quite entire at the base, glabrous, almost sessile; branches beset with glandular dots, glabrous. *h.* 2ft. Canada, 1816. A handsome little shrub. (F. D. 2583.)

B. lenta (pliant). *fl.* greenish-white. May to June. *l.* cordate, ovate, acutely serrated, acuminate; petioles and nerves hairy beneath; scales of the strobiles smooth, having the side lobes obtuse, equal, with prominent veins. *h.* 60ft. to 70ft. Canada to Georgia, 1759. SYN. *B. carpinifolia.* (W. D. B. 2, 144.)

B. lutea (yellow).* *fl.* greenish-white. May. *l.* 3½in. long, and 2½in. broad, ovate, acute, serrated; petioles pubescent, shorter than the peduncles; young shoots and leaves, at their unfolding, downy, but ultimately quite glabrous, except the petiole, which remains covered with fine short hairs; scales of the strobiles having the side lobes roundish. *h.* 70ft. to 80ft. Nova Scotia, 1767. SYN. *B. excelsa.*

B. nana (dwarf).* *fl.* whitish-green; catkins erect, stalked, cylindrical, obtuse; the barren ones lateral, and the fertile ones terminal; scales of the latter three-lobed, three-flowered, permanent. April and May. *l.* orbicular, crenate, reticulated with veins beneath. *h.* 1ft. to 3ft. Scotland, Lapland, Sweden, Russia, &c. A shrub with numerous branches, slightly downy when young, and beset with numerous little, round, firm, smooth, sharply crenated leaves, beautifully reticulated with veins, especially beneath; and furnished with short footstalks, having a pair of brown lanceolate stipules at their base. There is also a pretty variety named *pendula*, with drooping branches.

B. nigra (black).* The Black Birch. *fl.* greenish-white; female catkins straight, and nearly cylindrical, about 2in. long. May. *l.* rhomboid-ovate, doubly serrated, acute, pubescent beneath, entire at the base; scales of the strobiles villose; segments linear, equal. *h.* 60ft. to 70ft. New Jersey to Carolina, 1736. SYN. *B. rubra.* (W. D. B. 2, 153.)

B. papyracea (papery).* *fl.* greenish-white; female catkins on long footstalks, drooping; scales having the side lobes short, somewhat orbiculate. May to June. *l.* ovate, acuminate, doubly serrate; veins hairy beneath; petiole glabrous; the branches are much less flexible than those of the common Birch, and are more ascending. *h.* 60ft. to 70ft. North America, 1750. (W. D. B. 2, 152.)

B. p. fusca (brown). *l.* smaller than those of the type, and less downy.

B. p. platyphylla (broad-leaved).* *l.* very broad.

B. p. trichoclada (hairy-branched).* *l.* cordate. Branches extremely hairy, and twigs in threes.

B. populifolia (Poplar-leaved).* *fl.* greenish-white. April, May. *l.* deltoid, much acuminated, unequally serrated, quite smooth; scales of the strobiles having roundish side lobes; petioles glabrous. *h.* 30ft. Canada, 1750. This species, although very closely resembling *B. alba*, grows with less vigour, and does not attain so large a size. (W. D. B. 2, 151.)

B. p. laciniata (laciniated).* *l.* large, shining, and deeply cut.

B. p. pendula (pendulous).* Spray drooping, like that of *B. alba pendula.*

B. pumila (dwarf).* *fl.* whitish; female catkins cylindrical. May and June. *l.* roundish ovate, on long footstalks, densely clothed with hairs on the under surface. Branches pubescent, dotless. *h.* 2ft. to 3ft. Canada, 1762. A very beautiful kind, suitable for furnishing large rockeries, or planting on hill sides, or rocky ground. (W. D. B. 2, 97.)

B. rubra (red).* Synonymous with *B. nigra.*

BETULEÆ. A tribe of deciduous shrubs or trees. Perianth none, or bract-like; flowers monœcious, in catkins, in twos or threes. Fruit, a dry, compressed, lenticular, often winged, indehiscent nut. Leaves alternate, simple, stipulated. The genera are *Alnus* and *Betula.*

BI. In compound words, this signifies twice.

BIANCEA SCANDENS. *See* **Cæsalpinia sepiaria.**

BIARUM (an ancient name of a plant). ORD. *Aroideæ*. A genus of small, hardy, tuberous-rooted perennials, much more curious than pretty, allied to *Sauromatum*. This genus, according to Dr. Masters, differs from *Arum* in its spathe being tubular at the base, with the limb spreading. The female flowers have a distinct style, and the fruit contains only one ovule. They will thrive in any light, rich, well-drained soil, and may otherwise be treated similar to the hardy *Arums*. There are several other species besides those named, but they are not yet in general cultivation.

B. constrictum (constricted). A synonym of *B. tenuifolium*.

B. gramineum (grassy). A synonym of *B. tenuifolium*.

B. tenuifolium (slender-leaved).* *fl.*, spathe dark brown-purple, reflexed in the upper part; spadix very long, subuliform. June. *l.* linear-lanceolate. *h.* 6in. South Europe, 1570. SYNS. *B. gramineum* and *B. constrictum*. (B. R. 512, under name of *Arum tenuifolium*.)

BIAURICULATE. Having two auricles.

BIBRACTEATE. Furnished with two bracts.

BIBRACTEOLATE. Furnished with two secondary bracts.

BICARINATE. Two-keeled.

BICOLOR. Two-coloured.

BICONJUGATE. Having two secondary petioles, each with a pair of leaflets.

BICORNUTE. With two horn-like processes.

BIDENS (from *bis*, twice, and *dens* a tooth; in reference to the seed). Bur Marigold. ORD. *Compositæ*. A rather large genus of mostly hardy annual and perennial herbs, distinguished by the pericarp having from two to four rigid awns, which are rough with minute deflexed points. Involucre erect, of several oblong, nearly equal, parallel scales. Most of the species of this genus are of no merit as garden plants. Two are natives of Britain, viz., *B. cernua* and *B. tripartita*. They thrive in any ordinary garden soil. Propagated by divisions of the plant; or by seeds.

B. atro-sanguinea (dark-bloody). *fl.-heads* black-crimson, very freely produced. Late summer and autumn. Leaves pinnate. Root tuberous. *h.* 3ft. Mexico. (B. M. 5227.)

B. ferulæfolia (Ferula-leaved). *fl.-heads* yellow. Autumn. *l.* bipinnatifid. *h.* 2ft. Mexico, 1799. SYN. *Coreopsis ferulæfolia*. (B. M. 2059.)

B. procera (tall). *fl.-heads* yellow, large. *l.* finely divided, deep green. A handsome perennial. *h.* 6ft. to 8ft. Mexico, 1820. (B. R. 684.)

B. striata (striped). *fl.-heads* rather large, in a panicled leafy corymb; ray florets white; disk yellow. *l.* ternately pinnated, glabrous. *h.* 2ft. to 3ft. Autumn. Mexico. (B. M. 3155.)

BIDENTATE. With two teeth.

BIEBERSTEINIA (named after Frederic Marschall Bieberstein, a Russian naturalist, author of "Flora Taurico-Caucasica," and other works). ORD. *Rutaceæ*. A genus of half-hardy herbaceous perennials. They thrive in a compost of loam, peat, and sand. Propagated by cuttings, placed under a hand glass in early summer; or by seeds, sown in a slight hotbed in March or April.

B. odora (sweet). *fl.* yellow; racemes terminal, simple; petals entire. May. *l.* impari-pinnate; leaflets roundish, deeply toothed. Plant beset with glandular hairs. *h.* 1ft. Altaia, 1837.

BIENNIAL. A term applied to plants occupying two years in the development from seed to the maturation of seed: growing one year, flowering, fruiting, and dying the next. Seeds of Hardy Biennials are, as a rule, sown from June to August, to flower the succeeding season. Tender varieties are sown in a frame or cool house, and kept there all winter, being transferred from the frames or houses to the open border, in June. Wallflowers, Foxgloves, Canterbury Bells, and Sweet Williams, may be taken as fair types of Biennials, although they often assume more than a Biennial character on light sandy soils.

BIFARIOUS. Two-ranked; arranged in two opposite rows.

BIFID. Divided about half-way down into two parts; two-cleft.

BIFOLIATE. Compound leaves with two leaflets.

BIFRENARIA (from *bis*, twice, and *frœnum*, a strap; in reference to a double strap or band, by means of which the pollen masses are connected with their gland). ORD. *Orchideæ*. A genus of pretty stove Orchids, allied to *Maxillaria*, and distinguished from it by having two frœna or caudicles to their pollen masses. For culture, *see* **Maxillaria**.

B. aurantiaca (orange-coloured).* *fl.* orange; lateral lobes of lip semi-cordate, middle one transverse, sub-undulated, callous at the base; raceme erect. October. *l.* oblong, plicate. Pseudo-bulb roundish, compressed, two-leaved. *h.* 9in. Demerara, 1834. (B. R. 1875.)

B. aureo-fulva (orange-tawny). *fl.* orange, on long pedicels; lip unguiculate, three-lobed; scape radical, many-flowered. October. *l.* oblong-lanceolate. Pseudo-bulb roundish-ovate, wrinkled, one-leaved. *h.* 1ft. Brazil, 1840.

B. Hadwenii (Hadwen's). *fl.* each nearly 4in. across; petals and sepals ½in. broad, yellow green, beautifully blotched or mottled with a rich brown; lip large, above 1in. broad, white, with striped spots of rose. June. *l.* long, ½in. broad. *h.* 1½ft. Brazil, 1851. SYN. *Scuticaria Hadwenii*. (B. M. 4629.)

B. H. bella (charming).* A new variety with sepals and petals whitish yellow outside, brilliant shining cinnamon inside, with a few spots, bars, and blotches of whitish sulphur colour; lip wide, white, with one light brown spot behind, and a larger one in front of the callus; radiating light brown lines on lateral lobes, and mauve ones on anterior lobe.

B. H. pardalina (leopard-marked).* A very beautiful variety, having sepals and petals with brown circles or polygonal figures on a light yellow ground; lip light ochre-coloured at its basilar part, white in front, with radiating mauve-purple streaks. This variety is extremely rare.

B. vitellina (yolk-coloured).* *fl.* yellowish purple; lip cuneate, three-lobed; lateral lobes acute, crenulated; racemes drooping. July. *l.* lanceolate. Pseudo-bulb ovate, bluntly angular, one-leaved. *h.* 1ft. Brazil, 1838.

BIFURCATE. Twice-forked.

BIGELOVIA (named after Dr. Jacob Bigelow, author of "Florula Bostoniensis," &c.). ORD. *Compositæ*. A genus of hardy shrubs, sub-shrubs, or herbaceous plants, as now understood, comprising several subjects formerly referred to *Chrysothamnus*, *Linosyris*, &c. Flower-heads disposed in corymbs; involucre imbricated, oblong, or campanulate; receptacle flat. Leaves alternate, linear or lanceolate. They thrive in any ordinary garden soil. Propagated by cuttings.

B. Howardii (Howard's). *fl.-heads* yellow; involucre narrow. A low shrub. SYN. *Linosyris Howardii*.

B. nudata (naked). *fl.-heads* yellow. September. *l.* scattered, oblanceolate or linear. *h.* 1ft. to 2ft. New Jersey. Perennial.

B. paniculata (panicled). *fl.-heads* yellow, barely ½in. long, loosely panicled, five-flowered. California. Shrubby.

BIGEMINATE. Doubly paired.

BIGLANDULARIA. *See* **Sinningia**.

BIGNONIA (so named by Tournefort, in compliment to the Abbé Bignon, librarian to Louis IV.). ORD. *Bignoniaceæ*. A large genus of usually scandent shrubs, furnished with tendrils; rarely erect trees or shrubs. Flowers axillary and terminal, usually panicled; corolla with a short tube, a campanulate throat, and a five-lobed, bilabiate limb. Leaves opposite, simple, conjugate, ternate, digitate or pinnatifid. These handsome plants are particularly suited for large houses, where, if well grown, they give great satisfaction. The primary point in their culture is to obtain free and, at the same time, sturdy growth, giving due attention to training, pruning, &c., or the plants soon exceed all limits. Like all free-growing plants, Bignonias thrive best planted out in the borders of the stove or greenhouse, or out of doors, as the case may be; but the space allowed should be limited, in order to restrict root production. They may either be trained to cover the back wall, or be planted in a border in front, and trained up the rafters, or on wires, arranged where most desirable. In summer, allow all the strongest shoots to grow, training them so as to have as much sunlight as possible—which is absolutely necessary to well

Bignonia—*continued.*

ripen the wood, and make it capable of producing flowers—without entirely shutting it out from the plants below. Soil: A compost of two parts fibrous loam, one part peat, one of leaf mould, and a due proportion of sand, will be found most satisfactory. The loam and peat should be used in a rough state, unsifted, as this will keep the border open for some years, and thorough drainage should be effected. Propagation: Seed being rarely procurable, the most satisfactory method of propagation is by cuttings, made of good strong shoots, in early spring. Three joints are sufficient to make a cutting, if short-jointed; if long-jointed, two are sufficient. Place them in a well-drained pot of sandy soil, under a bell glass, in bottom heat. As these cuttings are young and fleshy, they are liable to damp off; hence it is necessary, for the first two or three weeks, to wipe the moisture from the glasses

FIG. 250. BRANCH AND FLOWERS OF BIGNONIA MAGNIFICA.

Bignonia—*continued.*

every morning, and water sparingly. If well managed, they will root in about two months, and should then have the glasses left off every night for a week; they should then be transferred to small pots in the compost above described, passing it through a coarse sieve, to extract the stones and rough pieces of soil. After potting, the plants should be kept close for a short time, till they are able to bear full exposure to the light. In a year's time, they will be large enough to plant out in their permanent quarters. Bignonias may also be increased by layering.

B. æquinoxialis (equinoxial). *fl.* yellow; peduncles two-flowered, terminal ones racemose. June to October. *l.* glabrous, conjugate; leaflets oblong-lanceolate. Tendrils simple, axillary. Cayenne, 1768.

B. æ. Chamberlaynii (Chamberlayn's).* *fl.*, corolla yellow, funnel-shaped; segments obtuse; racemes axillary, six to eight-flowered. April to October, *l.*, leaflets ovate, acuminated, glabrous, shining above. Tendrils strong, simple. Brazil, 1820. (B. R. 741.)

B. æsculifolia (Chestnut-leaved). A synonym of *Tabebiua æsculifolia.*

B. apurensis (Apuran). *fl.* pedicellate, 2in. long; corolla yellow, funnel-shaped, with roundish, spreading, nearly equal lobes; spikes terminal, sessile. *l.* ternate; leaflets elliptic-oblong, short-acuminated, acutish at the base. Shady banks of the river Apures, near El Diamante, 1824.

B. argyreo-violascens (silvery-violet). *l.* white-veined, in a young state violet. South America, 1865. (F. M. 1865, 26.)

B. aurantiaca (orange). *fl.* orange-coloured. South America, 1874.

B. capreolata (tendrilled).* *fl.*, corolla orange; peduncles axillary, one-flowered, crowded. April to August. *l.* conjugate; leaflets cordate oblong; lower ones simple. Tendrils small, trifid. North America, 1710. Hardy in south of England. (B. M. 864.)

B. c. atro-sanguinea (dark blood-red). *fl.* red-purple. Summer. United States. (B. M. 6501.)

B. Cherere (Chirere).* *fl.*, corollas orange, 2in. long; cymes axillary. June to November. *l.*, lower ones ternate, upper ones conjugate, cirrhose; leaflets ovate, acuminated, sometimes subcordate, glabrous. Guiana (in woods and on the banks of rivers), 1824. (B. R. 1301.)

B. Chica (Chica). *fl.*, corolla funnel-shaped, violaceous; limb with nearly equal, rounded segments; panicles axillary, pendulous. *l.* 8in. to 10in. long, abruptly bipinnate; leaflets conjugate, elliptic-ovate, acuminated, deeply cordate, glabrous. Tendrils simple. Banks of the Orinoco, 1819.

B. chrysantha (yellow-flowered). *fl.* terminal, crowded; corolla yellow, 2in. long. May. *l.*, leaflets five, ovate, acuminated, tomentose, on pedicels 5in. long. *h.* 12ft. to 25ft. Caracas, 1823. Tree.

B. chrysoleuca (yellowish-white). *fl.*, corolla yellow, with a white limb, glabrous, 1¼in. long; peduncles three to five-flowered. June, July. *l.* conjugate; leaflets 5in. to 6in. long, 2in. broad, oblong acuminated, glabrous, rounded at the base, shining. Tendrils undivided. Banks of the River Magdalena, 1824.

B. Clematis (Clematis-like).* *fl.*, corolla white, yellowish inside; lobes nearly equal, roundish, red; panicles axillary, downy. *l.* 7in. to 8in. long, conjugately pinnate, with an odd one; leaflets 2in. long, 1in. broad, ovate, narrowed at top, acute, cordate at the base, glabrous. Branches quadrangular, glabrous. Caracas, 1820.

B. diversifolia (diverse-leaved). *fl.*, corolla yellow, campanulately funnel-shaped; panicles terminal. *l.* conjugate and simple; leaflets roundish-ovate, acuminated, sub-cordate, glabrous, shining. Tendrils undivided. Branches quadrangular, striated. Mexico, 1825.

B. floribunda (many-flowered).* *fl.*, corolla purplish, funnel-shaped, eight lines long; panicles axillary, powdery, with opposite branches and dichotomous branchlets. *l.* conjugate; leaflets 2½in. long, oblong-elliptic, acuminated, acute at the base, glabrous, shining. Tendrils undivided. Branches beset with white warts and fine powder. Mexico, 1824.

B. lactiflora (milk-flowered). *fl.*, corolla milk white, 1½in. long, villously tomentose on the outside; racemes twin, with a petiolate bract at the base of each pedicel. April and July. *l.* conjugate; leaflets 2in. long, cordate, ovate, glabrous. Branches striated. Tendrils trifid. Santa Cruz, 1823.

B. leucoxyla (white-wooded). A synonym of *Tabebiua leucoxyla.*

B. litoralis (shore). *fl.*, corolla funnel-shaped, red, downy outside; panicles axillary, dichotomously branched. May to July. *l.* ternate; leaflets roundish-ovate, acuminated, clothed with soft hair on both surfaces. Branches terete, glabrous; branchlets hairy. Mexico, 1824.

B. magnifica (magnificent).* *fl.* varying from delicate mauve to rich purplish-crimson; throat light primrose colour, very large, 3½in. across; panicles large, branching. Summer. *l.* opposite, on rather long petioles, broadly ovate. Columbia, 1879. A very handsome species. See Fig. 250, for which we are indebted to Mr. Bull.

Bignonia—*continued.*

B. mollis (soft). *fl.* small, downy; panicle terminal, many-flowered. *l.* trifoliate; leaflets 5in. long, ovate, sub-cordate, downy on both surfaces. Cayenne, 1818.

B. mollissima (very soft). *fl.*, corollas somewhat funnel-shaped, downy inside; panicles axillary, dichotomously branched, downy. *l.* conjugate and simple; leaflets 2½in. long, 1½in. broad, ovate, acute, cordate, clothed with soft hairs above. Caraccas, 1820.

B. pallida (pale).* *fl.* axillary, usually solitary; corolla 2in. long, funnel-shaped, with a yellow tube, and a pale lilac limb; lobes crenately ciliated. July. *l.* simple, opposite, oblong, obtuse, rather cordate at the base. Branches terete. St. Vincent, 1823. (B. R. 965.)

B. picta (painted). A synonym of *B. speciosa.*

B. radicans (rooting). *See* **Tecoma radicans.**

B. reticulata (netted). Columbia, 1873.

B. Roezlii (Roezl's). Columbia, 1870.

B. salicifolia (Willow-leaved). *fl.*, corolla funnel-shaped, 1½in. long, copper-coloured, with a white limb; peduncles axillary, three to six-flowered, downy. Summer. *l.* conjugate; leaflets lanceolate, 3in. long, acute at both ends, quite glabrous, shining. Branches terete, sulcate. Trinidad, 1824.

B. speciosa (beautiful).* *fl.* pink, stained with purple; calyx spathaceous, split on one side; panicles terminal. May. *l.* pinnate, ternate and verticillate; leaflets oblong-lanceolate, acuminate, shining, serrate. *h.* 4ft. Uruguay, 1840. A glabrous evergreen shrub. SYN. *B. picta.* (B. M. 3888.)

B. spectabilis (showy). *fl.*, corolla 3in. long, rather coriaceous, glabrous, purple; racemes terminal, short, having the two lower pedicels three-flowered, and the rest one-flowered. *l.* conjugate; leaflets ovate-oblong, acuminated, obtuse. Santa Cruz, &c., 1820.

B. Tweediana (Tweedie's). *fl.* yellow; corolla glabrous, limb deeply five-parted, ciliated; segments emarginate; peduncles one-flowered. Summer. *l.* conjugate; leaflets lanceolate, acuminate; petioles downy. Buenos Ayres, 1838. (B. R. 26, 45.)

B. variabilis (variable).* *fl.*, corolla 3in. long, with a greenish-yellow tube; limb ultimately white; racemes simple, short, many-flowered, terminal. June to August. *l.*, lower ones biternate; superior ones conjugate; divisions ternate. Branches tetragonal. Tendrils trifid. Caraccas, 1819.

B. venusta (lovely). *fl.*, corolla crimson, clavately funnel-shaped, with a spreading border, villous inside; corymbs terminal, many-flowered. August to December. *l.*, lower ones ternate; superior ones conjugate; leaflets oblong-ovate, acuminated oblique at the base. Brazil, 1816. (B. R. 249.)

BIGNONIACEÆ. A large order of trees, or twining or climbing shrubby plants. Flowers usually trumpet-shaped; corolla usually irregular, four or five-lobed, and with a swollen portion below its mouth; stamens five, unequal. Fruit, a two-valved, often pod-like capsule. Leaves usually opposite, compound. The best-known genera are *Bignonia, Catalpa, Eccremocarpus, Jacaranda,* and *Tecoma.*

BIJUGATE. A compound leaf, with two pairs of leaflets.

BILABIATE. Having two lips.

BILBERRY. *See* **Vaccinium Myrtillus.**

BILIMBI TREE. *See* **Averrhoa Bilimbi.**

BILL. A cutting instrument, curved forward, or hook-shaped toward the point, and fitted with a handle, like a hatchet. It is used for pruning, &c. When short, it is called a Hand-bill; when long, a Hedge-bill, or Hedge-hook.

BILLARDIERA (in honour of Jacques Julien Labillardiere, a celebrated French botanist and traveller). Apple Berry. ORD. *Pittosporeæ.* Very desirable greenhouse evergreen climbers. Peduncles solitary from the apex of the branches, one-flowered, pendulous; calyx of five subulate sepals; petals five, combined into a tube below, generally yellow; stamens five. Fruit edible. Leaves alternate. They thrive either in pots or planted out in a compost of fibrous loam, leaf soil, and peat, in equal proportions, with thorough drainage. Cuttings, dibbled in a pot of sandy soil, placed under a bell glass, in gentle heat, root readily. They may also be raised from seed, which several of the species produce in abundance.

B. angustifolia (narrow-leaved). A synonym of *B. scandens.*

B. longiflora (long-flowered).* *fl.* greenish-yellow, often changing to purple, solitary; pedicels glabrous. Berries blue. May to August. *l.* lanceolate, entire. Van Diemen's Land, 1810. A very

Billardiera—*continued.*

free-growing and profuse-flowering species. SYN. *B. ovalis.* See Fig. 251. (B. M. 1507.)

FIG. 251. FRUITING PORTION OF BILLARDIERA LONGIFLORA.

B. mutabilis (changeable). A synonym of *B. scandens.*

B. ovalis (oval-leaved). A synonym of *B. longiflora.*

B. scandens (climbing).* *fl.* cream-coloured, at length purplish, solitary; pedicels same length as the flower. June to September. *l.* lanceolate-linear, entire. Branches, when young, villous. New Holland, 1795. SYNS. *B. mutabilis, B. angustifolia.* (B. M. 1313.)

BILLBERGIA (named after J. G. Billberg, a Swedish botanist). ORD. *Bromeliaceæ.* A genus of handsome stove plants. Flowers borne on light panicles; calyx three-parted; corolla of three convolute petals, scaly at the base; stamens inserted into the base of the perianth. Leaves harsh, rigid. These require much the same treatment as recommended for *Æchmea.* The most suitable soil is a mixture of peat, leaf soil, and loam in about equal parts, to which is added some sharp sand, to keep it open and porous. Free and perfect drainage is absolutely necessary for the successful culture of this class of plants, and a layer of moss should be placed over the crocks previous to filling the pots with soil. Although fond of heat, Billbergias will, when in flower, bear removal to a cooler house than a stove; and, if they are kept a little dry at the same time, the change will greatly prolong their flowering period. The stronger growing kinds thrive well in rich, well-drained loam and leaf mould. Propagation is effected by carefully taking off the suckers which form at the base, after the plants have done flowering; but, before doing this, they should be allowed to attain a good size. The suckers grow quickly when attached to the parent stem, from which they derive their strength, and feel the check less when severed; besides which, they become more mature, and are in better condition for rooting. The best method to adopt is as follows: Take the sucker in the hand and gently twist it off the stem; next trim the base by the removal of a few of the lower leaves, and then insert each sucker separately in a small pot, in sharp soil. A bottom heat of about 80deg. will greatly facilitate new root-growth; failing this, they will root freely in the temperature of a stove if placed in a shaded position for two or three weeks, after which they will bear increased light and sunshine during the later part the day. *See also* **Æchmea** and **Androlepis.**

Billbergia—*continued.*

B. amœna (pleasing). *fl.* greenish-white, tipped with blue, loosely panicled; bracts rose-coloured. July to winter. *l.* ligulate, abruptly acuminate, slightly spiny. *h.* 2ft. Brazil, 1817. (B. R. 344.)

B. Baraquiniana (Baraquin's).* *fl.* green; spikes long, the upper portion pendulous, bearing four or five large, oblong-lanceolate, bright scarlet bracts at the base of the flowers; the stem above the bracts is hoary white. Early spring. *l.* ligulate, tapering to a point, where, as well as at the edges, they are armed with sharp reddish spines, arched, transversely variegated with white scurfy bars. *h.* 1½ft. Brazil, 1865. (I. H. 1864, 421.)

B. chlorosticta (green-spotted). Synonymous with *B. Saundersii.*

B. iridifolia (Iris-leaved).* *fl.* red and yellow, tipped with blue, in drooping spikes; rachis and bracts crimson. March. *l.* lanceolate, ensiform, 1½ft., grey beneath. *h.* 1ft. Rio Janeiro, 1825. (B. R. 1068.)

B. Liboniana (Libon's).* *fl.*, outer perianth segments beautiful coral red, about half as long as the inner ones, which are whitish at the base, and a splendid purple upwards. Winter. *l.* in a dense rosette. *h.* 1ft. Brazil, 1858. (B. M. 5090.)

B. Lietzei (Lietz's).* *fl.* in loose terminal racemes, each subtended by lanceolate pink bracts; sepals rosy pink, half as long as the greenish corolla. *l.* tufted, ligulate, acute; margin spiny. Brazil, 1881. A double-flowered variety, with petaloid stamens, is mentioned by M. Morren, which is interesting in being the first double-flowered Bromeliad yet recorded. (B. H. 1881, 97.)

B. marmorata (marbled).* *fl.* deep blue; calyces green, tipped with blue; bracts very large, leafy, oblong, bright scarlet; panicles erect, branched, much longer than the leaves. *l.* broadly ligulate, sheathing at the base, truncate-mucronate at the apex; edges very regularly toothed, deep green, freely blotched and barred with dull reddish-brown. (I. H. 2, 48.)

B. Moreli (Morel's).* *fl.*, sepals red, densely woolly, less than half as long as the purplish-violet petals; spike dense, drooping; bracts large, deep rosy red, much longer than the solitary sessile flowers. February. *l.* arching, lanceolate, shining green on both surfaces; marginal spines few and weak. *h.* 1ft. Brazil, 1848. An excellent basket plant. SYN. *B. Moreliana.* (B. H. 1873, 1, 2.)

B. Moreliana (Morel's). Synonymous with *B. Moreli.*

FIG. 252. FLOWERS OF BILLBERGIA NUTANS.

B. nutans (nodding). *fl.*, sepals reddish; petals yellowish-green, both with a blue margin; scapes slender, nodding, with a few large rosy bracts, terminating in a short drooping spike. Winter. *l.* numerous, long, narrow, ensiform, remotely spiny. *h.* 1½ft. Brazil, 1868. See Fig. 252. (B. M. 6423.)

B. pallescens (pallid). *fl.* greenish-white; ovary deeply grooved; spike pendulous; bracts lanceolate, of a beautiful rose-pink. Winter. *l.* dark green, and spotted on the upper surface, paler

Billbergia—*continued.*

beneath, with transverse bars. *h.* 1½ft. Brazil, 1856. SYNS. *B. pallida* and *B. Wioti.*

B. pallida (pale). Synonymous with *B. pallescens.*

B. pyramidalis (pyramidal). *fl.* red, with purple margin, in erect spikes; bracts lanceolate, rosy. February. *l.* curved, ligulate-lanceolate, with white bands beneath. *h.* 1ft. Peru, 1822. (B. H. 1873, 16.)

B. Quesneliana (Quesnel's).* *fl.* deep purple; bracts fleshcoloured; upper ones variegated with white. *h.* 6ft. Guiana, 1874. An erect growing species, possessing the same habit as *B. rosea-marginata*, but having the leaves more acuminate, and deep green in colour. SYN. *Quesnelia rufa.* (F. d. S. 10, 1026.)

B. rosea-marginata (rose-margined).* *fl.*, inflorescence a dense oblong spike of light blue, subtended by large, broad, deep, rose-coloured bracts, with scarious margins. January. *l.* sheathing at the base, about 2ft. long, channelled, spiny on the margin, and marked with transverse mealy bands. *h.* 1½ft. Tropical America, 1880. SYNS. *B. rubro-marginata* and *Quesnelia roseo-marginata.*

B. rubro-marginata (red-margined). Synonymous with *B. rosea-marginata.*

B. Saundersii (Saunders').* *fl.* about 2in. long, disposed in a loose pendulous inflorescence; sepals crimson, half the length of the petals, which are yellow outside and blue within. *l.* tufted, ligulate, rounded at the apex, terminated by a short mucro, saw-toothed, green above, purple beneath, and spotted white on both surfaces. Brazil, 1868. SYN. (according to Morren) *B. chlorosticta.* (F. M. n. s. 106.)

B. thyrsoidea (thyrsoid). *fl.* dense, in thyrsoid spikes, almost without bracts. June. *l.* green, ligulate, shortly acuminate, the margin toothed. *h.* 1ft. Brazil, 1850. (B. M. 4756.)

B. vittata (striped). *fl.* indigo blue, with crimson calyces and bracts; racemes nodding. *l.* banded, ligulate, elongate, shining. *h.* 1½ft. Brazil, 1843. (B. H. 1871, 14, 15.)

B. Wioti (Wiot's). Synonymous with *B. pallescens.*

B. zebrina (zebra-streaked).* *fl.* greenish; scape clothed with large, pale, salmon-coloured bracts; inflorescence gracefully curved downwards. Early spring. *l.* sheathing for about half their length, forming thus a sort of tube, deep green, with zones of grey, the whole deepening with age. *h.* 1½ft. South America, 1826. SYN. *Helicodea zebrina.* (L. B. C. 1912.)

BILOBATE. Two-lobed.

BINATE. In pairs.

BINDING. The process of securing a graft or bud in its place by means of Raffia or Bast. The same term is applied to hard clay or other soil impervious to water, in summer.

BINDWEED. *See* **Convolvulus.**

BIOPHYTUM (from *bios*, life, and *phyton*, a plant; the leaves of one species being sensitive to the touch). TRIBE *Oxalideæ* of ORD. *Geraniaceæ.* A genus of pretty and interesting perennials, differing from *Oxalis*, in which genus it has been included, in the valves of the capsule being patent and separate to the base. They will thrive in a mixture of loam and peat. Propagated by seeds, which should be sown in spring, on a hotbed. Probably the only species in cultivation is the following:

B. sensitivum (sensitive). *fl.* yellow, small. July. *l.*, leaflets oblong, obtuse, mucronate. *h.* 6in. India and China, 1823. The leaves of this plant contract on the slightest touch. SYN. *Oxalis sensitiva.* (B. R. 31, 68.)

BIOTA. *See* **Thuya.**

BIOTIA. *See* **Aster corymbosus.**

BIPARTITE. Divided into two nearly to the base.

BIPINNATE. Twice pinnate.

BIPINNATIFID, or **BIPINNATIPARTED.** Having both primary and secondary segments of a leaf divided, but not to the base.

BIPLICATE. Having two folds or plaits.

BIRCH. *See* **Betula.**

BIRD-CHERRY. *See* **Cerasus Padus.**

BIRDLIME. A preparation made from Mistletoe berries and Holly bark. It is used for catching birds.

BIRD-PEPPER. *See* **Capsicum baccatum.**

BIRDS. As a class, Birds are very much more useful than hurtful in gardens. Owls are of great use in catching mice, and Night-jars in catching night-flying insects,

Birds—*continued.*

Rooks are very useful in lessening the numbers of wireworms, and of hurtful insects in general; but, if very numerous, they may be driven to eat potatoes and other vegetable food, and may then do harm. The same may be said of Starlings. Blackbirds and Thrushes feed much on snails and worms, but they also feed on the ripe fruits in gardens. As a rule, slender-billed birds feed almost wholly on insects or other animals, and are to be encouraged in gardens at all seasons. Among these may be enumerated the Tree-creeper, Wryneck, Warblers, and Wrens of various kinds, Chats, Hedge-sparrow, Larks, Redstart, Robin, Titmice, and Wagtails. Swifts, Swallows, and Martins, are also great destroyers of insects. The Finches feed, in part, on insects, but also eat large quantities of seeds, and often do considerable damage among plants grown for seed, *e.g.*, Cabbages, and in the seed-beds. Sparrows are about the most troublesome, though they are often assisted by Buntings, Chaffinches, Linnets, and others. When seed-beds or fruits have to be protected, this may be done by nets; or, more simply, by threads tied to sticks a few inches above the surface of the ground, or in front of the trees.

BIRD'S-EYE PRIMROSE. *See* **Primula farinosa.**

BIRD'S-FOOT. *See* **Ornithopus.**

BIRD'S-FOOT FERN. *See* **Pellæa ornithopus.**

BIRD'S-NEST FERN. *See* **Asplenium Nidus.**

BIRTHWORT. *See* **Aristolochia.**

BISCUTELLA (from *bis*, double, and *scutella*, a saucer; in allusion to the form of the silicles). Buckler Mustard. ORD. *Cruciferæ.* Perennial or annual herbaceous plants, usually hispid, but sometimes downy or smoothish. Flowers yellow, scentless; pedicels filiform, bractless. Leaves oblong, entire, toothed or pinnatifid, somewhat radical or cauline. Stems round, erect, usually corymbosely branched at the top by racemes, which, when in flower, are short, but elongated at the time of fruiting. All the species produce seeds freely. The annuals should be sown in the open borders. Some of the perennial kinds are well adapted for ornamenting rockwork, in a dry, sunny situation. Of the annuals, *columnæ*, *lyrata*, *maritima*, and *obovata*, are best. Of the perennials, *coronopifolia*, *lævigata*, and *sempervirens* are the most desirable, but none are worth cultivation outside botanical collections.

BISERIAL, or **BISERIATE.** Arranged in two parallel rows.

BISERRATE. Toothed in a saw-like manner, but with the primary teeth again serrated.

BISULCATE. Doubly furrowed.

BITERNATE. Twice ternate.

BITTER ALMOND. *See* **Amygdalus communis amara.**

BITTER APPLE. *See* **Citrullus Colocynthis.**

BITTER-SWEET. *See* **Solanum Dulcamara.**

BITTER VETCH. *See* **Orobus.**

BITUMINOUS. Clammy, adhesive.

BIVONÆA (named after Antonio Bivona-Bernardi, a Sicilian botanist, author of "Sicularum Plantarum Centuria I. et II.," Palermo, 1806). ORD. *Cruciferæ.* A pretty little monotypic genus, well adapted for ornamenting rockwork or the front of flower borders. A dry sandy soil is most suitable for its culture. Propagated by seeds, sown in spring where the plants are intended to remain, thinning-out being necessary to ensure full growth.

B. lutea (yellow).* *fl.* yellow, small; racemes terminal, elongated as they grow; pedicels filiform, bractless. April. *l.* alternate, lower ones stalked, the rest sessile, cordate, stem-clasping at the base, ovate, toothed, bluntish. Stem filiform, sparingly branched. *h.* 3in. to 6in. Sicily, 1823. An annual.

BIXA (its South American name). Arnatto. ORD. *Bixineæ*. Stove evergreen trees, with dichotomous panicles of large reddish flowers, broad cordate leaves, and prickly capsules. A compost of loam and peat is well adapted to their culture. Propagated by seed, sown when ripe in bottom heat; or by cuttings, which root freely in sand, under a hand glass, in heat; the latter is the better method. If grown from seed, the trees attain a large size before they flower; whereas cuttings, taken from a flowering plant and struck, may be brought to flower when small plants.

B. Orellana (Orellana). *fl.* pale peach-coloured; corymbs terminal, panicled; peduncles two, three, and four-flowered. May to August. *l.* cordate, ovate, acuminated, entire or angular, smooth on both surfaces. The drug called Arnatto is prepared from the red pulp which covers the seed of this species. It is used in the preparation of chocolate, and by farmers for colouring cheese, and also as an orange or yellow dye for silks. *h.* 30ft. West Indian Islands, 1690. See Fig. 253. (B. M. 1456.)

BIXINEÆ. An order of smoothish tropical trees or shrubs, not remarkable for any particular beauty. Flowers with or without petals, when present five and sepal-like; stamens indefinite in number, inserted in the receptacle or at the bottom of the calyx; peduncle axillary or terminal, bracteate. Fruit fleshy or dry. Leaves alternate, simple, entire, or slightly lobed, usually full of pellucid dots. The genera best known are *Azara*, *Bixa*, and *Flacourtia*.

FIG. 253. FLOWERING BRANCH OF BIXA ORELLANA.

BLACK BEARBERRY. *See* **Arctostaphylos alpina.**

BLACK BEETLES. *See* **Cockroaches.**

BLACKBERRY. *See* **Rubus fruticosa.**

BLACK BRYONY. *See* **Tamus communis.**

BLACK BULLACE. *See* **Prunus insititia.**

BLACKBURNIA. *See* **Xanthoxylum.**

BLACK FLY or **BEAN FLY** (*Aphis rumicis*), also called Collier and Black Dolphin. This Fly (see Fig. 254) is found on many herbaceous plants. It is very injurious to Beans; hence, immediate means of de-

Black Fly—*continued.*

struction must be employed directly the insect appears. Its extermination is an extremely difficult matter; but the following remedies are very effectual:

FIG. 254. THE BEAN FLY.

a, Female, magnified; *b*, Male, natural size, and magnified.

Tobacco Water. This, made and applied as recommended for **Aphides** (which *see*) is a good remedy; but it is rendered more certain by the employment of soapsuds, instead of clear water, in its manufacture.

Paris Green (Arseniate of Copper). Owing to its poisonous nature, this should not be used where there is fruit on the trees or vegetables under them; but there is no better destroyer of hard-dying insects. Its application is very simple. Mix 1lb. of the green with 30gals. of water, and well wet the infested parts of the trees, using a fine-rosed watercan or garden engine for the purpose. The operator's hands should be free from sores and scratches, or dangerous ulcerations may ensue.

Gas Liquor. If this can be obtained from a gas-house, it should be diluted with twice its bulk of water, and applied in the same manner as Paris Green, being washed off with clean water in a few hours. If the process be repeated on two or three consecutive nights, it will be found certain in its effects; moreover, it is not very poisonous. The finger or thumb, or the Aphis brush, applied early, will often exterminate these obnoxious insects at once. The first of the methods above described is perhaps the most accessible and the safest to use. Poisonous insecticides are

Black Fly—*continued.*

more or less dangerous, especially in the hands of the inexperienced. Black Fly is, however, one of the most difficult insects to eradicate, especially if allowed to multiply. A syringing of clean water should follow either of the above applications. *See also* **Aphides.**

BLACK JACK OAK. *See* **Quercus nigra.**

BLACK MAIDENHAIR SPLEENWORT. *See* **Asplenium Adiantum-nigrum.**

BLACK PINE. *See* **Pinus austriaca.**

BLACKTHORN. *See* **Prunus spinosa.**

BLACK VARNISH TREE. *See* **Melanorrhœa.**

BLACK WATTLE. *See* **Callicoma serratifolia.**

BLADDER CATCHFLY. *See* **Silene inflata.**

BLADDER KETMIA. *See* **Hibiscus Trionum.**

BLADDER NUT. *See* **Staphylea.**

BLADDER SENNA. *See* **Colutea.**

BLADDER WORT. *See* **Utricularia.**

BLADE. The lamina or expanded part of a leaf.

BLÆRIA (named after Patrick Blair, M.D., F.R.S., who practised medicine at Boston, in Lincolnshire, and was author of "Miscellaneous Observations," 1718; "Botanic Essays," 1820, &c.). ORD. *Ericaceæ*. Pretty little greenhouse evergreen shrubs, natives of Southern and Tropical Africa. Flowers terminal, glomerate; corolla short-tubular, with a four-cleft limb, very freely branched. Leaves verticillate, with revolute margins. For culture, *see* **Erica.**

B. articulata (jointed).* *fl.* reddish; heads drooping. May. *l.* four in a whorl, ovate or linear, glabrous, and shining; bracts solitary. *h.* 1ft. 1795.

B. ericoides (Heath-like). *fl.* purplish-red. August. *l.* four in a whorl, oblong, obtuse, ringed; bracts three, length of the calyx. *h.* 2ft. 1774. SYN. *Erica orbicularis.* (L. B. C. 153.)

B. purpurea (purple). *fl.* purple; heads drooping. June. *l.* four in a whorl, ovate, sub-ciliated. Stem flexuous, erect. *h.* 2ft. 1791.

BLAKEA (named after Martin Blake, of Antigua, a great promoter of useful knowledge). ORD. *Melastomaceæ*. Handsome stove evergreen shrubs or trees. Flowers red, large, showy; peduncles axillary, terete, one-flowered, naked, opposite or solitary, shorter than the leaves, usually with brown tomentum. Leaves petiolate, three to five-nerved, coriaceous, glabrous above and shining, but usually densely clothed with rusty tomentum beneath. They thrive well in peat, or a mixture of loam and peat, and require to be liberally supplied with water, particularly in spring and summer. Cuttings root freely if taken from shoots that are quite ripe (otherwise they are apt to rot), planted in a pot of sand, and plunged in a moist heat, under a hand glass.

B. quinquenervia (five-nerved). *fl.* flesh-coloured, large, with white disks; peduncles twin, shorter than the petioles. June. *l.* elliptic, acuminated, naked, and shining on both surfaces, five-nerved. *h.* 10ft. to 16ft. Guiana, 1820. (A. G. 210.)

B. trinervia (three-nerved). *fl.* rose colour, large; peduncles solitary, longer than the petioles. June. *l.* oval-oblong, three-nerved, glabrous and shining on both surfaces in the adult state, and when young serrulated; petioles and branchlets clothed with rusty tomentum. Roots issuing from the branches and stems. *h.* 4ft. to 8ft. Jamaica, 1789. (B. M. 451.)

BLANCHING. This process is effected for the purpose of obtaining crispness, and for converting what would, under ordinary circumstances, be a dangerous plant—in the case of Celery especially so—into a highly popular delicacy. Blanching can only be accomplished by entirely excluding the light from the plants, thus depriving the colouring matters of their power to decompose water and carbonic acid gas. It is also termed Etiolation.

BLANDFORDIA (named after George, Marquis of Blandford). ORD. *Liliaceæ*. A very beautiful genus of greenhouse bulbous plants, natives of Australia. Flowers solitary, on recurved pedicels; perianth funnel-shaped, six-

Blandfordia—*continued.*

cleft; stamens six. Leaves linear, elongate, striate; radical ones dilated, and somewhat sheathing at the base; others shorter and more distant, appearing on the flower-stem. The best soil in which to grow them is loam and peat in equal proportions, with a little rough silver sand added. They should be repotted moderately firm in the autumn, allowing good drainage, and should then be placed under the greenhouse stage, or in any other position where they will be free from water drippings. Water must only be given when dry, until they commence to grow, when it may be gradually increased, and they may be introduced into a higher temperature, if necessary, there to remain till after flowering. When the foliage is ripened off, they may be stored away until the time for re-potting. Propagated by seeds and offsets, or by division of the old plants, which must be done when repotting.

B. aurea (golden).* *fl.* 1½in. to 2in. long; scape bearing an umbellate cluster of three to five pure golden-yellow drooping bell-shaped flowers. Summer. *l.* narrow, linear, keeled or channelled, from the base of which the flower-scape arises. *h.* 1ft. to 2ft. 1870 (B. M. 5809.)

B. Cunninghamii (Cunningham's).* *fl.* rich coppery red, the upper part yellow; about 2in. long, bell-shaped, pendulous; from twelve to twenty, terminating in a stout scape 3ft. high. June. *l.* linear, slightly keeled at the back, about ¼in. broad. This magnificent species should have a little charcoal mixed with the soil already mentioned. (B. M. 5734.)

B. C. hybrida (hybrid). *fl.* red, margined with clear yellow, bell-shaped, in a dense drooping umbel.

B. flammea (fiery).* *fl.* dullish yellow, in dense umbel-like clusters; bracts ovate-lanceolate, stiff; perianth inversely conical. June. *l.* linear, bluntly keeled. *h.* 2ft. 1849.

B. f. elegans (elegant).* *fl.* crimson, tipped with yellow, large, funnel-shaped. Summer. *l.* long, linear-ensiform. This very handsome form is often taken for the type.

B. f. princeps (magnificent).* *fl.* rich orange-red externally, and bright yellow within, about 3in. long, tubular, borne on a scape about 1ft. high, slightly pendulous, and arranged near the summit. Summer. *l.* stiff, sub-erect, long, bright green, disposed in a distichous manner. This is a very splendid greenhouse plant, and should be in every collection. 1873. SYN. *B. princeps.* See Fig. 255. (B. M. 6209.)

B. grandiflora (large-flowered).* *fl.* crimson, very large; bracts as long as the pedicels, the inner much the shortest. July. *h.* 2ft. 1812. (B. R. 924.)

B. intermedia (intermediate). *fl.* yellow, pendulous, funnel-shaped, in sixteen to twenty-flowered racemes; bracts leaf-formed. September. *l.* channelled, acutely keeled, scabrous on the margins. *h.* 1½ft.

B. marginata (margined). *fl.* orange-red, conical, in long pendulous racemes; bracts narrow, foliaceous, about equalling in length the pedicels. July. *l.* stiff, sub-erect, with scabrous margins. *h.* 2ft. 1842. (B. R. 31, 18.)

B. nobilis (noble).* *fl.* orange, with yellow margins, on long pedicels, drooping, disposed in a terminal raceme; bracts twice as short as the pedicels. July. *l.* very narrow. *h.* 2ft. 1803. (B. M. 2003.)

B. princeps (magnificent). Synonymous with *B. flammea princeps.*

BLATTA. *See* **Cockroaches.**

BLEABERRY. *See* **Vaccinium Myrtillus.**

BLEACHING POWDER. *See* **Chloride of Lime.**

BLECHNUM (from *Blechnon*, the Greek name of a fern). ORD. *Filices*. A very attractive genus of stove and greenhouse Ferns, thriving in a compost of peat, leaf soil, and loam. Sori linear, continuous, or nearly so, parallel with, and usually contiguous to, the midrib. Involucre distinct from the edge of the frond. Fronds uniform, generally pinnate or pinnatifid. Veins usually free. For general culture, *see* **Ferns.**

B. australe (southern).* *cau.* stout, creeping, scaly. *sti.* erect, 4in. to 6in. long. *fronds* 9in. to 18in. long, and from 2in. to 3in. broad, lanceolate, narrowed towards both ends; pinnæ numerous, the barren ones 1in. to 1½in. long, ¼in. to ⅜in. broad, linear, hastate-cordate, or auricled at the base, especially on the upper side, with a very coriaceous texture; fertile pinnæ narrower. *sori* in a continuous or slightly broken line, close, but not contiguous, to the midrib. South Africa, &c., 1691. Greenhouse species.

B. boreale. *See* **Lomaria Spicant.**

B. braziliense (Brazilian).* *cau.* erect, stout, sub-arborescent, 1ft. or more long, densely clothed at the crown with dark brown scales. *sti.* short, stout, densely scaly. *fronds* oblong-lanceolate,

Blechnum—*continued.*

2ft. to 4ft. long, 6in. to 16in. broad, narrowing downwards very gradually; pinnæ close, linear, 4in. to 8in. long, ¼in. to ⅜in. broad, narrowed gradually towards the point, finely toothed or undulated, connected at the base. Brazil and Peru, 1820. See

Blechnum—*continued.*

pinnæ numerous, linear, 4in. to 6in. long, about ¼in. broad, narrowed gradually towards the point, margin finely toothed, dilated, and connected at the base. *sori* in a broad line close to the midrib. Temperate Australia, 1820. Greenhouse species.

FIG. 255. BLANDFORDIA FLAMMEA PRINCEPS.

Fig. 256. (H. S. F. 3, 157.) There is a very pretty variety met with in gardens under the name of *Corcovadense crispum*, which is not quite so strong-growing as the type, with wavy, crispy edges. They will all thrive in the cool of a stove fernery.

B. cartilagineum (cartilaginous). *cau.* oblique, densely scaly at top. *sti.* strong, erect, 4in. to 6in. long, scaly, muricated in the lower part. *fronds* ovate-oblong, 2ft. to 3ft. long, 6in. to 12in. broad;

B. hastatum (halbert-shaped).* *rhiz.* short, stout, scaly. *sti.* 4in. to 6in. long, nearly naked. *fronds* from 9in. to 18in. long, and 2in. to 4in. broad, lanceolate, with twenty to forty pinnæ on each side; the barren ones 1in. to 1½in. long, lanceolate, falcate, narrowed gradually to a point, the lower side slightly truncate, and slightly lobed, the upper cordate, with a large hastate auricle; fertile pinnæ narrower. *sori* midway between the midrib and margin;

Blechnum—*continued.*

FIG. 256. BLECHNUM BRAZILIENSE.

rachis and surfaces naked or slightly pubescent; texture coriaceous. Temperate South America, 1841. Greenhouse species.

B. Lanceola (lance-leaved). *rhiz.* slender, creeping, stoloniferous. *sti.* slender, erect, 2in. to 4in. long. *fronds* lanceolate, undivided, 4in. to 6in. long, ¼in. broad, or less, narrowed gradually from the centre towards each end. Tropical America, 1820. Stove species.

B. L. trifoliatum (three-leaved). *fronds* furnished with one or two pairs of small oblong-obtuse lateral pinnæ at the base of the large terminal one. Stove variety. (H. S. F. 3, 94.)

B. longifolium (long-leaved).* *rhiz.* slender, creeping. *sti.* firm, erect, nearly naked, 6in. to 12in. long. *fronds* 6in. to 9in. long, with a terminal pinna, and three to six lateral ones on each side, which are 3in. to 5in. long, and ¼in. broad, narrowed gradually towards the point. *sori* in broad lines close to the midrib; texture coriaceous. Tropical America, 1820. *B. l. fraxineum* is a variety found in gardens under the name of *B. fraxinifolium*, with a habit more close than the type; pinnæ six to eight on a side, sometimes 1in. broad. *B. intermedium* (Link.) and *B. gracile* (Kaulf.), often seen in gardens, are slender-growing varieties of this rather variable stove species.

B. nitidum (shining).* *sti.* stout, erect, naked, 3in. to 4in. long. *fronds* oblong-lanceolate, 1ft. or more long, 4in. to 6in. broad; pinnæ numerous, sub-falcate, linear, 3in. to 4in. long, ¼in. to ½in. broad, narrowed gradually towards the point, dilated and connected at the base; edge undulate-dentate; texture coriaceous; both surfaces smooth. Stove species. The variety *contractum*, often seen in gardens, has its pinnæ contracted, and the edge much undulated. Brazil. (H. S. F. 3, 55.)

B. occidentale (western).* *cau.* stout, erect, scaly at the top. *sti.* 6in. to 12in. long, erect, scaly below. *fronds* ovate-acuminate, 9in. to 18in. long, 4in. to 8in. broad, with twelve to twenty-four linear pinnæ on each side, which are 2in. to 4in. long, and about ¾in. broad, narrowed gradually to a point, truncate or cordate; texture coriaceous. West Indies, southwards to Chili and South Brazil, 1823. A very handsome stove or greenhouse fern.

B. o. multifidum (much-cut).* A pretty variety, said to have been introduced from Dominica; the apices of the pinnæ are copiously crested and tasselled, rendering it very desirable. Stove variety.

B. orientale (oriental).* *cau.* stout, erect, clothed at the crown with dark brown scales. *sti.* 4in. to 8in. long, strong, erect, scaly below. *fronds* 1ft. to 5ft. long, 6in. to 12in. broad, ovate, with very numerous nearly contiguous pinnæ on each side, which are 4in. to 8in. long, and about ¾in. broad, narrowed to a long point. Australia, northwards to South China and the Himalayas. Greenhouse.

B. polypodioides (Polypodium-like). A synonym of *B. unilaterale.*

B. serrulatum (saw-edged).* *cau.* elongated, stout, ascending. *sti.* 6in. to 12in. long, strong, erect, smooth, nearly naked. *fronds* oblong-acuminate, 1ft. to 2ft. long, 6in. to 9in. broad, with twelve to twenty-four pairs of quite distinct articulated linear oblong pinnæ on each side, which are about 4in. to 5in. long, ¼in. broad, narrowed gradually towards the point, and downwards to a narrow base, the margins finely incised. Florida, &c., 1819. Stove or greenhouse. SYN. *B. striatum.* (H. S. F. 3, 159.)

B. striatum (striped). A synonym of *B. serrulatum.*

B. unilaterale (one-sided).* *cau.* elongated, densely scaly at the crown. *sti.* slender, erect, 1in. to 4in. long, slightly scaly below. *fronds* lanceolate, 6in. to 12in. long, 1½in. to 2in. broad; pinnæ numerous, spreading horizontally, linear, ¾in. to 1in. long, central ones ¼in. to ⅜in. broad, point usually mucronate; edge entire, or nearly so, the lower part dilated to a broad base. *sori* in a line close to the midrib. Tropical America, 1829. Widely distributed. Stove or greenhouse species. SYN. *B. polypodioides*, under which name it is usually found in gardens.

BLECHUM (a Greek name for an unknown plant, supposed to resemble Marjoram). ORD. *Acanthaceæ.* Stove herbaceous perennials. For culture, &c., *see* **Justicia.**

B. Brownei (Browne's). *fl.* white, in a dense bracteated spike, which is four-cornered; bracts ovate, downy. Summer. *l.* ovate elliptical, somewhat toothed. *h.* 2ft. West Indies, 1780. The other species introduced are: *angustifolium*, blue; *braziliense*, blue; and *laxiflorum*, white.

BLEPHARIS (from *blepharis*, the eyelash; in reference to the fringed bracts of the calyx). ORD. *Acanthaceæ.* Dwarf shrubs or herbs, often spiny and woody, allied to *Acanthus.* Flowers in bracteate spikes; calyx cruciately four-parted, bracteate; upper segment entire, three-nerved; lower, two-nerved; corolla-tube very short; lip five-lobed, three lobes often much larger than the others; stamens four, sub-didynamous. For culture, &c., *see* **Acanthus.**

B. boerhaaviæfolia (Boerhaavia-leaved). *fl.* blue. July. *l.* usually four in a whorl, elliptic, toothed. *h.* 1ft. India, 1829. Stove annual.

B. capensis (Cape Colony).* *fl.* blue. July. *l.* narrow, lanceolate, spinose. *h.* 1ft. Cape of Good Hope, 1816. Greenhouse biennial.

B. furcata (forked-spined). *fl.* blue. July. *l.* lanceolate, entire or spiny; bracts large, strongly spinose. *h.* 2ft. Cape of Good Hope, 1846. Greenhouse evergreen shrub.

B. linearifolia (narrow-leaved). *fl.* blue. July. *l.* long, entire, linear, glabrous or hairy, not spiny. *h.* 2ft. Guinea, 1823. Stove annual.

B. procumbens (trailing).* *fl.* blue. July. *l.* linear lanceolate, spiny. *h.* 1ft. Cape of Good Hope, 1825. Greenhouse evergreen trailer.

BLEPHILIA (from *blepharis*, the eyelash; in allusion to the ciliated bracts). ORD. *Labiatæ.* Ornamental hardy perennials, closely allied to *Monarda*, but differing from it in the calyx tube having thirteen instead of fifteen nerves, and being naked in the throat, while the corollas are much smaller and more dilated. They are of easy culture in ordinary soil. Increased readily by dividing the roots in early spring.

B. ciliata (ciliated). *fl.* blue; whorls all distinct; bracts ciliated, reddish at top. July. *l.* almost sessile, ovate-oblong, narrowed at the base, canescent beneath. *h.* 1ft. to 2ft. North America, 1798.

B. hirsuta (hairy). *fl.* purple or blue; whorls more numerous than in the preceding; upper ones approximate. July. *l.* petiolate, ovate, roundly cordate at the base, hairy on both surfaces. *h.* 1ft. to 2ft. Virginia, 1798. Habit more branched and loose than in *B. ciliata.*

BLESSED THISTLE. *See* **Cnicus benedictus** (properly *Carbenia benedicta*) and **Silybum Marianum.**

BLETIA (in honour of Don Louis Blet, a Spanish botanist). ORD. *Orchideæ.* A large genus of, for the most part, stove terrestrial Orchids. Flowers purple or whitish, in terminal racemes. Leaves narrow, grass-like. Pseudo-bulbs round, flattened. The flowers are freely produced when the plants are thoroughly established, and are valuable for bouquets, as well for their pleasing colour as for the time they last in perfection. Bletias thrive best in a compost of loam and leaf mould. About 2in. of crocks, covered with a layer of moss, should be placed

Bletia—*continued.*

in the bottom of the pot, which should be filled to within 1in. of the top with soil. The bulbs should then be inserted, and just covered. A good supply of water during the growing season is necessary, and only a moderate amount of heat. After growth has ceased, a period of rest is required, during which time very little water should be given. Propagation is effected by divisions, which should be made after the plants have finished flowering, or previous to their starting into growth.

B. campanulata (bell-shaped). *fl.* deep purple, with a white centre, lasting a considerable time in perfection. Mexico.

B. florida (florid).* *fl.* pale rose-coloured; lip not spurred. July and August. *h.* 2ft. West Indies, 1786. A very pretty species. (B. R. 1401.)

B. gracilis (slender). *fl.* pale greenish-white; sepals and petals nearly equal, lanceolate, acuminate; lip red and yellow; scape simple. *l.* oblong, lanceolate, plicate. *h.* 1½in. Mexico, 1830. (B. R. 1681.)

B. hyacinthina (Hyacinth-like).* *fl.* purple, racemose; lip not spurred, beardless; scape about as long as the leaves. March to June. *l.* lanceolate. *h.* 1ft. China, 1802. This pretty species has proved to be quite hardy. (Garden, Nov., 1879.)

B. patula (spreading-flowered). *fl.* purple, spreading; scape tall, branched. March. *l.* lanceolate. *h.* 2ft. Hayti, 1830. (B. M., 3518.)

B. Shepherdii (Shepherd's).* *fl.* on branching spikes, purple, marked down the centre of the lip with yellow. Winter. *l.* long, lanceolate, dark green. Jamaica, 1825. (B. M. 3319.)

B. Sherrattiana (Sherratt's).* *fl.* about a dozen on a spike, rich rosy purple; petals very broad, twice the breadth of the sepals; lip deep purple in front, marked with white and yellow down the centre. *l.* three to four-plicate. Pseudo-bulbs depressed. New Grenada, 1867. (B. M. 5646.)

B. undulata (waved). A synonym of *Schomburgkia undulata.*

B. verecunda (modest). *fl.* purple; lip not spurred. January. *h.* 3ft. West Indies, Mexico, &c., 1733. (B. M. 930.)

BLIGHIA SAPIDA. This is now included under the genus **Cupania** (which *see*).

BLIGHT, or BLAST. Applied to various diseases of plants which are caused or accelerated either by the presence of parasitic fungi or insects, or by atmospheric influence. Blight generally proves fatal to the whole or part of the subject attacked.

BLIND. A term applied to plants which fail to produce central buds. The defect is frequently noticeable in plants of the *Brassica* tribe, and is, perhaps, mainly due to the attacks of insects. Great care should, therefore, be exercised in keeping the seed-beds clear of insect pests, by the application of ashes, lime and soot, or spent hops.

BLOOD FLOWER. *See* **Hæmanthus.**

BLOODROOT. *See* **Sanguinaria canadensis** and **Potentilla Tormentilla.**

BLOOM. A fine powder-like substance found on Grapes, Cucumbers, Plums, &c., and varying in colour in the different subjects. It should be carefully protected, as it improves the appearance of the fruit. The term is also often incorrectly used as the plural of blossom.

BLOSSOM. The flower of a plant, or the essential organs of reproduction, with their appendages.

BLUE-BELLS. *See* **Campanula rotundifolia** and **Scilla nutans.**

BLUE-BOTTLE. *See* **Centaurea Cyanus.**

BLUE GUM TREE. *See* **Eucalyptus globulus.**

BLUETS. The French name for *Centaurea Cyanus.* *See also* **Houstonia cærulea** and **Vaccinium angustifolium.**

BLUMENBACHIA (in honour of John Frederick Blumenbach, M.D., Professor of Medicine at Göttingen, and distinguished as a comparative anatomist). ORD. *Loasaceæ.* Elegant branched, climbing or trailing, annual, biennial, or perennial herbs, generally covered with stinging hairs, which are very objectionable. Flowers axillary, solitary, bracteate, very pretty and interesting. Leaves opposite, lobed. They are of easy culture in ordinary garden soil. Propagated by seeds, which should be sown

Blumenbachia—*continued.*

in pots, in spring, and placed in a gentle heat, where they will germinate in about a fortnight. When the seedlings are large enough, and after having been previously hardened off, they may be planted out in their flowering quarters, or potted on and trained to a trellis.

FIG. 257. BLUMENBACHIA CHUQUITENSIS.

B. chuquitensis (Chuquitan).* *fl.* solitary, axillary, with five to ten boat-shaped red petals, which are yellow within. September. *l.* oblong-lanceolate, pinnate; segments pinnatifidly lobed. Peru, 1863. Half-hardy climbing perennial. See Fig. 257. (B. M. 6143.)

B. contorta (twisted).* *fl.* orange-red, with cup-shaped green scales within. July. *l.* oblong-ovate, pinnatifid; lobes incisely toothed. Peru. Greenhouse climber, but may be grown against a wall, out of doors, during the summer. (B. M. 6134.)

FIG. 258. FLOWER OF BLUMENBACHIA CORONATA.

B. coronata (crowned).* *fl.* of pure glossy whiteness, quadrangular, crown-shaped, 2in. in diameter each way. June. *l.* narrow, bipinnatifid, cut into small segments. *h.* 1½ft. Chili, 1872. This is an elegant dwarf, tufted, erect biennial, with the pure white flowers imbedded in the metallic lustrous foliage. SYN. *Caiophora coronata.* See Fig. 258.

B. insignis (remarkable).* *fl.* with whitish petals and reddish-yellow scales, axillary, on long peduncles, about 1in. in diameter.

Blumenbachia—*continued.*

July. *l.*, lower ones five to seven-lobed; upper ones deeply bipinnatifid. *h.* 1ft. Chili, 1826. Hardy annual trailer. SYN. *Loasa palmata.* (B. M. 2865.)

BOBARTIA (named after Jacob Bobart, Professor of Botany at Oxford in the seventeenth century). ORD. *Irideæ.* A small genus of greenhouse or hardy bulbous plants, closely allied to *Sisyrinchium.* The species in cultivation are very pretty hardy plants, but require protection from severe frosts and excessive rains. They thrive best in a warm, light soil, and make pretty plants for rockwork. Propagated by separating the offsets during autumn. This genus has been much misunderstood. Among the plants which have been referred to it are some which now find places in the genera *Aristea, Homeria, Marica, Moræa, Sisyrinchium,* &c., &c.

B. aurantiaca. *See* **Homeria aurantiaca.**

B. gladiata (sword-shaped). *fl.* yellow, thinly sprinkled with purple dots near the centre, handsome, nearly 2in. across. *l.* linear, ensiform, narrow, slightly glaucous, 1ft. or more in length. 1817. SYN. *Marica gladiata.* (B. R. 229.)

B. spathacea (Rush-like). *l.* rush-like, several feet in length; flower-stem as long as leaves, bearing near extremity a cluster of pale yellow flowers, with narrow segments. Each flower lasts but one day; as a good many, however, are developed in each spathe, there is a succession which lasts some time. 1832. SYN. *Xyris altissima.* (L. B. C. 1900.)

FIG. 259. BOCCONIA CORDATA, showing Habit and Flower.

BOCCONIA (named after Paolo Bocconi, M.D., a Sicilian botanist, author of the "Museum des Plantes," and "Histoire Naturelle de l'Ile de Corse," &c.). ORD. *Papaveraceæ.* Two of the species are greenhouse or half-hardy shrubs. Flowers inconspicuous, in terminal panicles, with the branches and branchlets each furnished with one bract. Leaves stalked, glaucous, large, lobed. This genus does not well agree with the rest of *Papaveraceæ,* from its having one-seeded capsules and apetalous flowers. *B. cordata* is a handsome, hardy, herbaceous plant, with a stately habit and finely-cut foliage, and, where bold subjects are desired, few will be found superior to it. As an isolated

Bocconia—*continued.*

specimen on the lawn, or by frequented walks, where it will not be too closely surrounded by tall plants, it may be grown with marked effect. It also forms a good subject for pot culture, and is largely used for sub-tropical bedding. The soil most suitable for its culture is a good fat loam, of considerable depth. Propagated by cuttings, taken from the axils of the larger leaves, during early summer; or by young suckers, taken from established plants, during summer, as they will then flower the following season. If the former method is employed, the cuttings should be pushed on, so that there are plenty of roots before the winter sets in. The other two species require greenhouse culture; but both are eminently suited for sub-tropical gardening, in any light rich soil, or well-drained and airy situation. They are best propagated by seeds, sown in a hotbed in spring, the seedlings being placed out from June to September.

B. cordata (cordate).* *fl.* buff-coloured, very numerous, borne in very large terminal panicles; individually they are not showy, but the fully grown inflorescence has a very distinct and pleasing appearance. Summer. *l.* large, reflexed, deeply-veined, roundish-cordate; margins lobed or sinuated. Stems growing rather close together, thickly set with leaves. *h.* 5ft. to 8ft. China, 1795, and 1866. Mr. Robinson recommends its being grown in the angle of two walls which shelter it from the north and east. It runs quickly at the roots, and the suckers may be cut off to the benefit of the parent plant; each sucker will form a strong plant in a year's time. SYNS. *B. japonica* and *Macleaya yedoënsis.* See Fig. 259. (B. M. 1905.)

B. frutescens (shrubby).* *fl.* greenish. October. *l.* large, sea-green, oval-oblong, cuneated at the base, pinnatifid. *h.* 3ft. to 6ft. Mexico, 1739. (L. B. C. 83.)

B. integrifolia (entire-leaved). *fl.* greenish; panicle crowded. *l.* flat, oblong, tapering towards each end, entire, or scarcely crenated. *h.* 9ft. Peru, 1822.

B. japonica (Japanese). Synonymous with *B. cordata.*

BŒBERA (named after Bœber, a Russian botanist). ORD. *Compositæ.* A genus of evergreen greenhouse shrubs, now generally referred to *Dysodia.* They are of easy culture, thriving in ordinary garden soil. Propagated by cuttings, made of young, rather firm, shoots, and placed in sand, under a glass. There are several other species besides the one given below, but they are not of much horticultural value.

B. incana (hoary).* *fl.-heads* golden; peduncles one-headed. November. *l.* pinnate, rather hairy; leaflets linear acute, channelled, some entire, and some trifid. Stem hairy. *h.* 1½ft. Mexico, 1828. (B. R. 1602.)

BŒHMERIA (named after George Rudolph Bœhmer, a German botanist). ORD. *Urticaceæ.* A genus of shrubs or herbaceous plants, allied to *Urtica,* from which it is distinguished in not having stinging hairs. *B. nivea* is the only species having any horticultural value. This thrives best in a warm, sandy soil; and is increased by divisions.

B. nivea (snowy). *fl.* greenish, disposed in spikes. *l.* broadly cordate, about 6in. long by 4in. broad, terminating in a long slender point; edges serrate, covered on the under side with a dense coating of white down. *h.* 3ft. to 4ft. China. A shrub-like perennial, rather more curious than beautiful.

BOG BEAN. *See* **Menyanthes trifoliata.**

BOG-EARTH. *See* **Peat.**

BOILERS. These are very important articles in all gardens where there are glass houses, and the best should always be selected. They are made in cast and wrought iron, both of which have their special advantages and disadvantages. The former are less liable to burn through when encrusted with any deposit from the water, but will crack with sudden changes of temperature, by reason of the granular form of the metal not allowing gradual contraction; the latter may burn through where there is any deposit of mud or other matter, but they will not crack, and will stand a greater pressure than those made of cast metal. It is, however, the better plan to use Boilers of wrought iron, as, with careful usage, they are less liable to break down in hard frosts than are the others. As the value of the plants, as well as that

Boilers—*continued.*

of the Boiler, has to be considered, should such a contingency occur, it is certainly advisable to reduce all risks to a minimum; and as the average life of a Boiler is from ten to fifteen years, a slightly larger first cost is not of very serious moment. The forms of Boilers are very diverse, and, in some of the patented forms, complicated. But, whatever the shape, the following points are essential: A clear and unrestricted waterway of not less than 2in. in thickness; the greatest exposure of surface to the direct action of the fire; a sufficient fire space; and a fire-bar area calculated to supply enough fresh air to the fire to support thorough combustion. The forms generally used for horticultural work are the following, or some modifications of them; and, however grand the name, their chief value consists in the attested heating capacity at a given cost: The Saddle Boiler, which is made of various sizes, with or without check ends, cross tubes, and other devices for increasing the heating surface, and also of a tubular form; the Upright Cylinder (a vertical

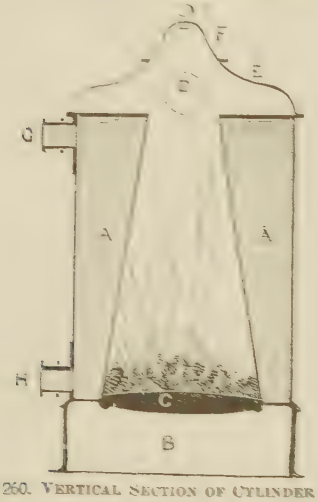


FIG. 260. VERTICAL SECTION OF CYLINDER BOILER.

A A, Wrought-iron Boiler, the shaded space showing the Waterway; B, Ashpit inside the cast base of Boiler; C, Fire-bars; D, Flue; E, Domed Top; F, Feeding Lid; G, Flow, and H, Return Pipe Sockets.

section of which is shown in Fig. 260); the Upright Tubular Cylinder; the Horizontal Tubular; and the Cornish or Horizontal Cylinder. Combinations of the various forms, and complicated patterns of different kinds, are made for particular purposes; but in no case should large Boilers be used, unless they are recommended by one competent to judge, as suitable for the purpose they are needed to fulfil. In every case, it is necessary that the Boiler should be fixed in a proper manner. It is also good policy to have Boilers about 30, or even 50 per cent., more powerful than is actually required, when they are new, as, from various causes, their heating power falls off in a year or two in many places; and, under ordinary work, it is not desirable to stimulate the action in order to command sufficient heat. There is no doubt that, for general purposes, some modification of the Saddle or Cylinder Boiler is by far the best, all things duly considered; but it is impossible to give any practical advice without a thorough knowledge of the requirements of any particular place. Gas Boilers are also useful for small places. These are made in many forms, and are, as a rule, in the shape of a cylinder, with a coned inside, against which the flames play. Some Gas Boilers have also a superheater attached: this exhausts the heat from the air which has passed through the Boiler. Another good form is made of horizontal tubes, which contain the water, the flames playing

Boilers—*continued.*

over and amongst them. An atmospheric burner of approved construction should be used where gas is the heating power. A sufficient supply of gas should be assured by using supply pipes of a good size. Care should be taken to keep these pipes free from water, and protected from frost by silicate cotton lagging, or some other good non-conductor. Except for very small places, however, gas apparatus is almost useless, and will never supersede fuel Boilers. For other particulars regarding Boilers, *see* **Heating** and **Stoking**.

BOIS-PERDRIX. *See* **Heisteria.**

BOLBOPHYLLUM. *See* **Bulbophyllum.**

BOLETUS (from *bolos*, a mass: in reference to its massy or globular form). ORD. *Fungi*. The only species of this rather large genus demanding mention is *B. edulis* (see Fig. 261), which is considered an excellent article of food. It is easily distinguished, and is often of large size and somewhat unshapely: the pileus is usually of a dusky

FIG. 261. COMMON BOLETUS (BOLETUS EDULIS).

yellow or brownish hue, but sometimes brighter and more of a chestnut colour: the flesh is white, and does not change to a blue colour when cut (this is a very important characteristic, and should always be noticed). It is a species common in most districts, usually growing in woods, and appearing chiefly in the autumn.

BOLEUM (from *bolos*, a ball: in reference to the shape of the seed-pods). ORD. *Cruciferæ*. An ornamental, hardy, evergreen shrub, well adapted for rockwork, in ordinary soil. It requires slight protection in winter if planted in very exposed situations. Propagated by seed, sown in a pot, in spring, and placed in a frame, or in the open border during summer.

B. asperum (rough).* *fl.* cream-coloured: racemes erect, elongated; pedicels very short, the lower ones bracteate. *Apptl.* l. alternate, oblong, linear; lower ones somewhat divided. A suffruticose, erect, branched plant, hispid from stiff hairs. *h.* 6in. to 1ft. France. 1815.

BOLLEA. *See* **Zygopetalum.**

BOLTED. A term used in reference to plants that have prematurely run to seed.

BOLTONIA (named after J. B. Bolton, an English professor of botany). ORD. *Compositæ*. A genus of rather pretty hardy herbaceous perennials. Flower-heads with white or purplish rays. Leaves pale green, lanceolate, sessile. They thrive in common garden soil. Propagated by divisions of the roots, in March.

Boltonia—*continued.*

B. asteroides (Aster-like).* *fl.-heads* flesh-coloured, stellate, disposed in a rather large terminal panicle. August. *l.* all entire, somewhat broadly lanceolate, narrowed at both ends. *h.* 2ft. North America, 1758. (B. M. 2554.)

B. glastifolia (Woad-leaved).* *fl.-heads* pink. September. *l.*, lower ones serrated. *h.* 1½ft. North America, 1758. (B. M. 2381.)

Bomarea—*continued.*

thriving in a compost of peat, leaf mould, loam, and sand, with good drainage. Manure water should be given during the season of growth. Although they make fine pot plants, their full beauty is only developed when planted out in the conservatory or greenhouse border. Propagated

FIG. 262. FLOWERS OF BOMAREA CARDERI.

BOMAREA (derivation of name doubtful). ORD. *Amaryllideæ*. A genus of handsome half-hardy twiners, closely allied to *Alströmeria*, from which it is chiefly distinguished by its twining habit and some difference in the capsule. They are of comparatively easy culture, by seeds, or by careful divisions of the underground stem. In making a division, it is necessary to observe that the part taken has some roots by which to live till new ones are formed. It should be potted at first, and may, when established, be planted out or shifted on. Seeds may be

Bomarea—*continued.*

raised in a warm house without difficulty. They germinate in a few weeks; and when the young plants are 2in. or 3in. high, they should be placed separately in small pots, shifting them on as necessary, or planting them out. In favoured southern localities, several species have proved hardy, but they are much the best when grown in a greenhouse.

B. acutifolia Ehrenbergiana (Ehrenberg's acute-leaved). *fl.* undulate, outer segments deep orange, the inner ones paler and spotted. Spring. *l.* lanceolate acute, smooth. Mexico, 1878. (B. M. 6444).

B. Caldasiana (Caldas's).* *fl.* orange yellow, spotted crimson. *l.* ovate-lanceolate, acute. Peruvian Andes, 1863.

B. Carderi (Carder's).* *fl.* 2½in. long by 1½in. in breadth at the widest part, regularly bell-shaped, with six segments, the three outer rose-coloured, the three inner nearly equal in length, crenulate, and spotted with purplish-brown; inflorescence pendulous, and consisting of a large terminal umbellate cyme, surrounded at the base by a series of crowded leaves. *l.* oblong lanceolate, acuminate, about 7in. by 2⅜in. Columbia, 1876. See Fig. 262, for which we are indebted to Mr. Bull.

B. chontalensis (Chontalese). *fl.* 1½in. long, sub-campanulate, obtusely trigonous; outer segments thick, fleshy, wavy, rose-red, with a few brown spots round the margin at the tip, very convex; inner segments a little shorter, pale yellow blotched with brown; umbels surrounded by a whorl of leaves, and composed of several peduncles, each bearing four to six nodding flowers. August. *l.* lanceolate or ovate oblong, acuminate. Nicaragua, 1871. (B. M. 5927).

B. conferta (dense-flowered). A synonym of *B. patococensis.*

B. edulis (edible). *fl.*, outer segments rose, green tipped; inner spotted with rose. St. Domingo, &c. One of the oldest species in cultivation. The tubers are said by Tussac to be eaten in St. Domingo, like those of the Jerusalem Artichoke. See Fig. 263.

B. frondea (leafy). *fl.* 2in. long, tubulate-campanulate; outer segments narrow, oblong, yellow; inner segments ½in. longer than the outer ones, canary yellow, spotted with red; cymes umbellate, many-flowered, about 8in. across, base leafy. *l.* lanceolate, acuminate. Bogota, 1881. (G. C. n. s. 17, p. 669.)

B. oligantha (few-flowered).* *fl.* regularly funnel-shaped, about 1in. long; outer segments slightly shorter than the inner, oblanceolate, under ½in. abroad, obtuse, unspotted, reddish on the outside, yellow within; one or two to an umbel, on simple, flexuous, glabrous pedicels, about 1in. long. *l.* long, acute, about 2in. long, bright green on the upper surface, ciliated on the ribs beneath. Peru, 1877. See Fig. 264.

B. patococensis (Patococha).* *fl.* 2in. to 2½in. long, elongate-funnel-shaped; the three outer segments ovate lanceolate, about one-fourth shorter than the inner segments, both of a rich crimson colour; numerously borne in drooping, contracted tufts at the ends of the shoots; peduncles about 2in. to 2½in. long, intermixed at the base with broadly ovate-acute, leafy bracts. August and September. *l.* scattered, shortly stalked, broadly lanceolate, tail pointed. Bogota, 1881. (G. C. n. s. 17, p. 187.) SYN. *B. conferta.*

FIG. 264. FLOWERING BRANCH OF BOMAREA OLIGANTHA.

B. salsilla (Salsilla). *fl.* purple, about ½in. long, the two inner segments having a darker spot at the base, and all of them tinged with green towards the points; collected into a terminal umbel. June. *l.* few, lanceolate. South America, 1806. This has proved quite hardy under various conditions.

B. Shuttleworthii (Shuttleworth's).* *fl.*, perianth about 2in. long, funnel-shaped or elongate bell-shaped; segments nearly equal, oblong acute, outer ones orange vermilion, slightly tinged with green and dotted with small dark spots at the tips; inner ones more acutely pointed, canary yellow, with a red midrib, and green with dark spots at the tips; cymes umbellate, pendulous. *l.* ovate lanceolate, 5in. to 6in. by 2in., glabrous. Bogota, 1881. (G. C. n. s. 17, p. 77.)

B. Williamsii (Williams's).* *fl.* rose-coloured, about 2in. long, elongate funnel shape; disposed in a compound umbellate cyme. *l.* lanceolate, very acute, and tapering to a very short twisted petiole. New Grenada, 1882.

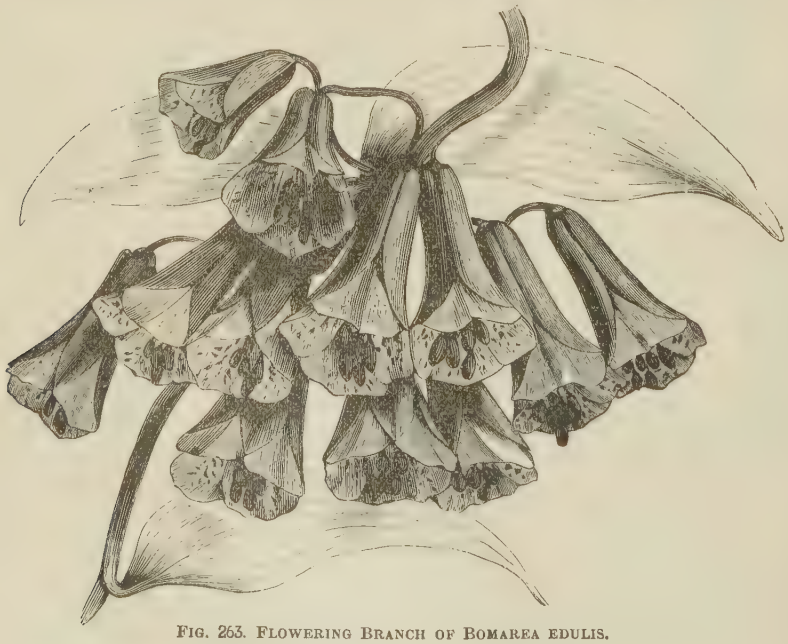


FIG. 263. FLOWERING BRANCH OF BOMAREA EDULIS.

BOMBACEÆ. A sub-order of *Malvaceæ.*

BOMBAX (from *bombax*, one of the Greek names for cotton; the pods are filled with a fine silky substance like cotton, but which it is impossible to spin into thread, in consequence of the edges being perfectly smooth). Silk Cotton Tree. ORD. *Malvaceæ.* A genus of large soft-wooded stove trees. Flowers

Bombax—*continued.*

scarlet or white, large, usually rising laterally from the trunk or branches, either singly or in clusters. They grow best in a rich loamy soil. Cuttings, not too ripe, taken off at a joint, placed in sand under a bell glass, in moist heat, will root readily; but plants raised from seeds brought from their natural habitats make finer trees.

B. Ceiba (Ceiba). *fl.* pale red, large. *l.* palmate, with five leaflets. *fr.* turbinate, concave at the apex. *h.* 100ft. South America, 1692.

BOMBYX NEUSTRIA. *See* **Lackey Moth.**

BONA-NOX. *See* **Ipomæa Bona-Nox.**

BONAPARTEA. *See* **Tillandsia.**

BONAPARTEA JUNCEA. A synonym of *Agave geminiflora.*

BONATEA (in honour of M. Bonato, a distinguished Italian botanist, and a Professor of Botany at Padua). ORD. *Orchideæ.* A handsome terrestrial stove Orchid, allied to *Habenaria*, and requiring similar culture.

B. speciosa (showy).* *fl.* white, galeate; petals bipartite; raceme many-flowered, compact; bracts cucullate, acuminate. August. *l.* oblong, sub-undulate. Stem leafy. *h.* 2ft. Cape of Good Hope, 1820. (B. M. 2926; L. B. C. 284.)

BONGARDIA (named after Heinrich Gustav Bongard, a German botanist). ORD. *Berberideæ.* A very pretty hardy tuberous-rooted perennial, requiring a sandy soil, and good drainage, with protection at all seasons from excessive wet, otherwise it will rot. It should be carefully planted in a compost of loam, peat, leaf soil, and sand, in equal proportions, and covered with a handlight.

B. Rauwolfii (Rauwolf's). *fl.* golden yellow, on pyramidal branched panicles; stamens and petals nearly equal in length. May. *l.* radical, pinnate; leaflets sessile, oval-oblong, three to five-cleft at the apex, glaucous, each with a dark purple blotch at the base. *h.* 6in. Syria, Persia, 1740. SYN. *Leontice Chrysogonum.* (B. M. 6244.)

BONNAYA (named after Bonnay, a German botanist). ORD. *Scrophularineæ.* A small genus of usually glabrous, rarely pilose, slender, creeping or erect, annual, biennial, or perennial stove plants, almost unknown in cultivation. Flowers axillary, opposite, or alternate from abortion, usually pedicellate, the upper ones sometimes racemose, pinkish, or blue. Leaves opposite, quite entire, or toothed. They thrive in a rich sandy loam. The annual species are propagated by seeds, the others by divisions and cuttings.

BONNETIA (commemorative of Charles Bonnet, a French naturalist, who wrote some botanical papers in 1754). ORD. *Ternstræmineæ.* A genus of elegant middle-sized stove trees or shrubs. Flowers large, terminal; peduncles one or many-flowered. Leaves scattered, exstipulate, coriaceous, entire, one-nerved, marked with transverse veins, sub-sessile, narrowed to the base. They thrive well in a mixture of loam and peat. Cuttings of firm young shoots will root if placed in sand under a hand glass, in a moderate heat.

B. sessilis (stalkless). *fl.* purplish, terminal. *l.* oblong, coriaceous, entire. *h.* 15ft. Guiana, 1819.

BORAGE. *See* **Borago officinalis.**

BORAGINEÆ. A large order of herbs or shrubs, having spirally-coiled inflorescence; corolla usually regular and five-lobed, with an imbricated æstivation; throat generally hairy; stamens five, inserted in the corolla. Leaves alternate, rough. Among other genera belonging to this order may be named *Anchusa, Borago, Cynoglossum, Echium, Lithospermum,* and *Myosotis.*

BORAGO (derivation very uncertain; probably a corruption of some eastern name). Borage. ORD. *Borragineæ.* A genus of hardy herbaceous perennials or annuals, excellently adapted for naturalising in dry stony places. Flowers blue, panicled, drooping; corolla rotate; throat furnished with emarginate vaulted processes; anthers distinct, oblong or lanceolate, awned, fixed by the inner side, conniving into a cone. Nuts four, one-celled, turbinate, fixed to the bottom of the calyx. Leaves oblong or lanceolate. All the species are easily cultivated, thriving in any common soil. Propagated by divisions, in spring, or by striking

Borago—*continued.*

the young cuttings in a cold frame. They may also be raised from seed, which should be sown from March to May, in any good garden soil, and the plants, when large enough, thinned out to 1ft. or more apart. In hot weather, Borage is generally in demand for claret cup and other drinks.

B. laxiflora (loose-flowered).* *fl.* on long pedicels, racemose, drooping; corolla pale blue; segments ovate, bluntish, erectly spreading. May to August. *l.* oblong, and rough from strigæ; radical ones rosulate; cauline ones half stem-clasping. Stem decumbent, many from the same root, hispid from retrograde bristles. Corsica, 1813. Perennial. (B. M. 1789.)

B. longifolia (long-leaved).* *fl.* disposed in a terminal bracteate panicle; corolla blue; segments ovate, acute, spreading. July and August. *l.* linear-lanceolate, scabrous and downy beneath; cauline ones half stem-clasping. *h.* 1ft. Numidia, 1825.

FIG. 265. FLOWER OF BORAGO OFFICINALIS.

B. officinalis (officinal).* Common Borage. *fl.* blue, purple, or white; segments of the corolla limb ovate, acute, spreading. June to September. *l.*, lower ones obovate, attenuated at the base; cauline ones oblong, sessile, subcordate at the base. *h.* 1ft. to 2ft. Britain. This is the kind most cultivated in gardens for flavouring. See Fig. 265. (Sy. En. B. 36.)

BORASSUS (a name applied by Linnæus to the spathe of the Date Palm). ORD. *Palmæ.* A very small genus of stove trees, containing two noble species, which are distinguished by unisexual flowers, produced upon distinct plants, the males being borne in dense branching catkins, and the females on simple, or, more rarely, slightly branched spikes. Fruit very large, brown, three-seeded. Leaves fan-shaped, with spiny petioles. Trunks unarmed, often 70ft. high. They may be grown in good fibrous loam, leaf mould, and sand, mainly the former. Increased by seeds only, which require to be sown in strong bottom heat. Rarely seen in cultivation.

B. æthiopicum (African). *l.* nearly circular, and plaited, supported upon stout petioles, 6ft. to 7ft. long. Western Tropical Africa. This handsome, but rare, species is remarkable for the bulging out or swelling in its stem, near the middle, or about two-thirds of its height from the ground.

B. flabelliformis (fan-shaped).* *l.* nearly circular, and plaited like a partially-open fan, with about seventy ribs, which radiate from a common centre. *h.* 30ft. India, 1771.

BORBONIA (named after Gaston de Bourbon, Duke of Orleans, son of Henry IV. of France, a great lover and patron of botany). ORD. *Leguminosæ.* A genus of very ornamental greenhouse evergreen shrubs, natives of the Cape of Good Hope. Flowers yellow, disposed in terminal heads, axillary. Leaves simple, amplexicaul, alternate, exstipulate, pungent. They thrive well in a mixture of peat, loam, and sand, with good drainage. Cuttings, half-ripened, obtained in April, will root freely in sandy soil if placed under a bell glass, in a cool house.

B. barbata (bearded).* *fl.* sessile, villous on the outside. July. *l.* narrow, lanceolate, many-nerved, complicated, ciliately-bearded, and very much acuminated; branches diverging. *h.* 3ft. to 4ft. 1823.

B. cordata (heart-shaped). *fl.*, corolla densely villous, with the vexillum obcordate. July. *l.* cordate, many-nerved, quite entire, glabrous. Branches villous. *h.* 3ft. to 6ft. 1759.

B. crenata (crenated).* *fl.* less villous than in the rest of the species. July. *l.* cordate, roundish, acute, denticulated, many nerved and reticulated between the nerves, and are, as well as the branches, glabrous. *h.* 3ft. to 6ft. 1774. (B. M. 274.)

B. lanceolata (lance-shaped). *fl.* densely villous. July. *l.* ovate-lanceolate, pungent, many nerved, quite entire, sessile, glabrous, as well as the stem. *h.* 2ft. to 3ft. 1752. (L. B. C. 81.)

B. ruscifolia (Ruscus-leaved). *fl.* sparingly villous. July. *l.* cordate, many-nerved, minutely ciliated, but are otherwise glabrous, as well as the branches. *h.* 2ft. to 4ft. 1790. (B. M. 2128.)

BORDERS, FLOWER. Small beds, or a continuous bed, of greater length than width, skirting a wall or shrubbery, and containing plants of a heterogeneous character. They should be slightly raised above the surrounding level, and thoroughly drained. In the first preparation of the Border, it is most essential to deeply dig or trench the ground, thoroughly incorporating a large amount of well-bodied manure; and if the soil is very stiff, wood ashes or coarse sand should be well worked in with the manure. The best time to plant such Borders is in early autumn or in March.

Where, as is frequently the case, the Borders are only 2ft. or 3ft. wide, not more than two rows of plants, either in groups or singly, will be allowable. The tall plants or shrubs should constitute the background, with dwarfer subjects in front; but formal arrangements must be avoided. The object should be to secure a continuous succession of flowers. This would entail some little trouble at first, which, however, would be amply repaid by results.

No hard-and-fast rules can be laid down as to the arrangement of the plants, which depends on individual taste and means; but the best results are obtained when the border is mainly made up of hardy herbaceous perennials, as permanent occupants, assisted by liberal quantities of summer bedding plants, such as Dahlias, Fuchsias, Geraniums, Heliotrope, Tropæolums, &c., as well as many hardy annuals and biennials. By this means, a very varied and beautiful display may be maintained, especially if bulbs are used for early spring effect, such as Narcissi, Scillas, Snowdrops, Tulips, &c. Of course, the herbaceous perennials should be selected with much care, all weedy subjects being avoided, and variety in colour and time of flowering secured. Anything like a full list of these would occupy too much space for repetition here, but the following will be found very showy and useful: Achilleas, Aconitums, Anemones, Aquilegias, Armerias, Asters, Campanulas, Carnations and Picotees, Delphiniums, Dodecatheons, Doronicums, Fritillarias, Funkias, Gaillardias, Geraniums, Geums, Hollyhocks, Iberises, Irises, Liliums, Pæonies, Papavers, Pyrethrums, double and single, Ranunculus, Trolliuses, &c.

BORDERS, FRUIT. These should be well drained, and if not naturally so, the soil should be excavated from 3ft. to 5ft. deep, in order to form a bottom of stones, pieces of brick, clinkers, &c. Where it is convenient, draining pipes should be added, if an outfall in the vicinity can be secured. The base of the Border should be sloped to the front, where the pipes should be laid, and the bottom covered with draining material, thereby effectually preventing the fruit trees rooting deep, which is detrimental to healthy growth. Gross-feeding vegetables or flowers should not be grown on the surface, but shallow-rooting crops will generally do no harm. Many advocate the surface being kept free from crops of any sort, simply letting it be freely exposed; whilst others equally as strenuously condemn this plan. Where necessary, chalk or some other mineral constituent of good soil which is naturally absent, may be added; but much animal manure is rarely required. The depth and width of Border may vary for different fruit trees, but efficient drainage is in all cases important.

BORECOLE (*Brassica oleracea fimbriata*). An important division of the Brassica tribe, often cultivated in gardens under the name of Kale. It comes in very useful when hard weather has rendered cabbages, &c., unfit for use, as it endures cold better than most other green vegetables. Some are also grown as ornamental foliaged plants. Like all other plants of a similar description, they require rich soil, and they should be put out in June or early in July, as it is almost useless to plant this kind of vegetable after the middle of the latter month. To obtain the best results, the ground should be deeply dug and well manured; but it must not be full of crude manure at planting time, or it will make the plants too tender and succulent in wet seasons, with the result

Borecole—*continued.*

that the first sharp frost would cause them to rot. Good hard-stemmed plants are the kinds most needed, especially for crops required in spring, when green vegetables are scarce. Cultivation: Early in April, and again a month later for succession, the seeds should be sown thinly in nursery beds, not covering them too deeply. The soil should be in a friable condition, and it is an advantage if the first beds be made under a south wall. As soon as the seedlings appear, if they are too thick, they should be thinned, as those which are drawn up weak and spindly are useless. When large enough, they should be carefully planted out, choosing showery weather, if possible, for the operation. If it is necessary to plant them in dry weather, they must be well watered-in. The rows should be from 2ft. to 3ft. apart, according to the variety, and the plants 2ft. apart in the rows; or, if potatoes are planted wide apart, the Borecole may be arranged between them. Dead leaves must be cleared away from time to time, but no green ones should be broken off. When the tops are cut for use, the stems should not be denuded of foliage, as they will soon break again and form successional crops. The plants must be kept free from weeds. After April, the Kales are of little use; the stems may therefore be pulled up, and the ground planted with some other crop. They all require the same treatment, and at their various seasons come in equally useful.

Sorts. The distinct forms are somewhat limited, but being largely cultivated on the Continent as well as all parts of Britain on account of its hardy nature, the varieties of Borecole receive a large number of names that are either synonymous with, or indistinct from, a few well-known types. Dwarf Green Curled or Scotch is probably the best and most grown; other good hardy sorts are Asparagus Kale (this name is applied to several different kinds, the best one being in use very late in spring), Buda, Cottagers', Dwarf Purple, Imperial Hearting, Ragged Jack, and Tall Green Curled. Melville's Variegated and Variegated Borecole, amongst others, have fine ornamental foliage.

BORONIA (named after Francis Boroni, an Italian servant of Dr. Sibthorp, who perished from an accident at Athens; he collected specimens of many of those plants which are figured in the "Flora Græca"). ORD. *Rutaceæ*. Very elegant and useful shrubs, requiring similar treatment to ordinary greenhouse hard-wooded subjects, and much aided with a little extra heat in spring, when breaking into growth. Flowers pretty, pink-purplish or white; peduncles terminal, but usually axillary on the extreme branches, one to many-flowered; pedicels furnished at the base and middle with two opposite, short bracts, jointed, commonly dilated under the calyx. Leaves opposite, simple, or impari-pinnate, entire, or a little serrulated, full of pellucid dots. They should be placed out of doors from July to the middle of September; the most convenient place for them is in pits, as there are then greater facilities for protecting them from heavy rains and thunderstorms. When first put out, Boronias should not be fully exposed, but in the course of a week they may remain open to the full influence of both sun and air. Potting should be performed once a year, as soon as the top growth ceases, as the roots then extend themselves in preparation for their next year's functions. The best compost for them is one of peat and maiden loam in equal parts, and about one-sixth sharp silver sand. Many cultivators, however, prefer a compost consisting of good fibry peat and silver sand, together with some pieces of charcoal, smaller or larger, according to the size of the pots used. The soil should be rammed firmly in the pots, which must be well drained. The leading shoots should be pinched, to ensure good bushy specimens. Propagation may be effected by young cuttings, or those made from the half-ripened wood; these should be put into a thoroughly drained pot of sandy soil, with 1in. of sand on the surface, and covered with a bell glass, which must be frequently taken off and wiped dry.

Boronia—*continued.*

When in the cutting state, water must be very carefully given around the rim of the pot, without taking off the glass. If placed in a temperature of about 50deg., and shaded from bright noonday sun, they soon root, when they may be potted off singly into small pots, and plunged in sawdust, or cocoa-nut fibre refuse, in which situation but little water is needed. Pinching repeatedly, when young, is the only means to secure good ultimate growth. Air must be given on all possible opportunities.

B. alata (winged). *fl.* pale rose-colour, small; peduncles dichotomous, usually three-flowered; bracts fringed. May. *l.*, leaflets three to five pairs, or more, crenate, revolute, pilose on the nerves beneath, as well as the rachis. *h.* 2ft. to 6ft. New Holland, 1823. (L. B. C. 1833.)

B. anemonifolia (Anemone-leaved). *fl.* pink; peduncles axillary, solitary, one-flowered. May. *l.* stalked, trifid; segments narrow, wedge-shaped, furnished with two or three teeth at the apex, or quite entire. *h.* 1ft. to 3ft. New Holland, 1824. (P. M. B. 9, 123.)

B. crenulata (crenulate).* *fl.* red, small, with a fringed calyx; pedicels axillary and terminal, one-flowered. July. *l.* obovate, mucronulate, crenulated. *h.* 1ft. to 4ft. King George's Sound. (B. M. 3915.)

B. denticulata (finely-toothed). *fl.* rose-coloured; bracts deciduous; peduncles corymbose. March to August. *l.* linear, retuse, toothleted, terminated by a small point. *h.* 2ft to 6ft. King George's Sound, 1823. (B. R. 1000.)

B. Drummondi (Drummond's).* *fl.* pretty rosy pink, freely produced during spring and summer. *l.* pinnatifid. *h.* 2ft. New Holland. A very pretty species, with a slender but compact habit of growth. There is a white-flowered variety of this species. (F. d. S. 9, 881.)

B. elatior (tallest).* *fl.* pendulous, rosy carmine, very fragrant, disposed in long dense clusters along the ends of the branches. May. *l.* very prettily pinnately cut into linear segments. *h.* 4ft. Western Australia, 1874. (B. M. 6285.)

B. ledifolia (Ledum-leaved). *fl.* red; peduncles axillary, one-flowered, each bearing two bracts in the middle. March. *l.* linear-lanceolate, quite entire, downy beneath. *h.* 1ft. to 2ft. New Holland, 1814. (P. M. B. 8, 123.)

FIG. 266. FLOWERING BRANCHES OF BORONIA MEGASTIGMA.

B. megastigma (large-stigma).* *fl.* numerous, axillary, fragrant, drooping, ½in. in diameter, sub-globose, campanulate; petals nearly orbicular, concave, maroon purple outside, and yellow within. *l.* sessile, pinnate, with three to five narrow linear rigid leaflets. *h.* 1ft. Of slender habit, with twiggy branches. South-western Australia, 1873. See Fig. 266.

B. pinnata (pinnate).* *fl.* pink, with a scent like that of Hawthorn; peduncles dichotomous. February to May. *l.*, leaflets two, three or four pairs, linear, acute, quite smooth. *h.* 1ft. to 3ft. New Holland, 1794. (B. M. 1763.)

B. polygalæfolia (Polygala-leaved). *fl.* red; peduncles axillary, solitary, one-flowered. March to July. *l.* linear-lanceolate, quite entire, opposite, alternate, and three in a whorl. *h.* 1ft. to 3ft. Port Jackson, 1824.

B. serrulata (serrulate).* *fl.* of a deep rose colour, very fragrant; peduncles aggregate, terminal. July. *l.* trapeziform, acute, serrulated in front, smooth, full of glandular dots. *h.* 1ft. to 6ft. Port Jackson, 1816. (B. R. 842.)

B. tetrandra (four-stamened). *fl.* pale purple; pedicels short, one-flowered. May. *l.* impari-pinnate; leaflets four to five pairs, linear, obtuse, smooth; branches pilose. *h.* 1ft. to 4ft. New Holland, 1824. (P. M. B. 16, 227.)

BORRERIA (named after William Borrer, F.L.S., a profound botanist and cryptogamist). ORD. *Rubiaceæ*. A large genus of stove herbs or sub-shrubs, now referred to *Spermacoce*. Flowers small, white, rarely blue, disposed in verticillate heads, in the axils of the leaves, or on the tops of the branches, rarely cymose or corymbose. Leaves opposite, or the young ones disposed in fascicles in the axils of the old ones, and therefore appearing verticillate; stipules joining with the petioles, more or less sheathing, fringed by many bristles. Stems and branches usually tetragonal. The species are of easy culture, thriving in a light soil. Cuttings of the perennial kinds strike root readily in the same kind of soil, in heat. The annual kinds require a similar treatment to other tender annuals.

B. stricta (straight). A dwarf shrub, but closely allied to the next species. Porto Rico.

B. verticillata (whorled-flowered). *fl.* white. July. *l.* linear lanceolate, acuminated, opposite, but appearing verticillate from the fascicles of young leaves in the axils. *h.* 2ft. West Indies, 1732.

BOSCIA (named after Louis Bosc, a French professor of agriculture). SYN. *Podoria*. ORD. *Capparideæ*. A small genus of stove plants, requiring a soil of lumpy, fibry loam and peat. Propagated by cuttings of firm wood, placed in sand, under a glass, in heat.

B. senegalensis (Senegal). *fl.* white, small, apetalous, corymbose. *h.* 3ft. Senegal, 1824. An unarmed evergreen shrub (L. E. M. 395.)

BOSSIÆA (named after M. Bossier Lamartinière, a French botanist, who accompanied the unfortunate La Peyrouse round the world). ORD. *Leguminosæ*. A genus of elegant Australian greenhouse shrubs. Flowers yellow, axillary and solitary, the base of the vexillum or the keel generally blotched or veined with purple. Leaves simple, of various forms. A mixture of turfy loam, leaf mould, peat, and sand, with very free drainage, suits these plants best. Half-ripened cuttings will root freely if placed in a pot of sand with a bell glass over them, in a cool house. Seeds should be sown, in March, on a slight hotbed.

B. cinerea (ashy-grey). *fl.* yellow, the vexillum furnished with a purple circle at the base, and the keel dark purple. May. *l.* nearly sessile, cordate acute, ending in a spiny mucrone, scabrous above, but pilose on the nerves beneath, with recurved margins. Branches terete, crowded with leaves, villous. *h.* 1ft. to 3ft. 1824. SYNS. *B. cordifolia*, *B. tenuicaulis*. (B. M. 3895.)

B. cordifolia (heart-leaved). A synonym of *B. cinerea*.

B. disticha (two-ranked).* *fl.* yellowish-red; peduncles solitary, axillary, one-flowered, longer than the leaves. March to May. *l.* distichous, ovate, obtuse. Young branches terete. *h.* 1½ft. Swan River, 1840. (B. R. 1841, 55.)

B. ensata (sword-shaped). *fl.* yellowish, with the back and base of the vexillum of a brownish orange-purple colour; keel brownish-purple. April. Branches flat, linear, leafless, toothed, the teeth bearing the flowers; upper bracts distant from the lower ones, shorter than the pedicel. *h.* 1ft. to 2ft. 1825. (S. F. A. 51.)

B. foliosa (leafy). *fl.* yellow and orange. May to June. *l.* alternate, small, orbicular, retuse, scabrous, with revolute margins, silky beneath; stipules permanent, hooked, longer than the petioles. Branches straight, terete, villous. *h.* 1ft. to 3ft. 1824.

B. lenticularis (lentil-leaved). A synonym of *B. rhombifolia*.

B. linnæoides (Linnæa-like).* *fl.* yellow; keel dark brown; corolla about twice the length of the calyx; pedicels solitary

Bossiæa—*continued.*

one-flowered, elongated. May. *l.* elliptic, mucronate. Branches terete, prostrate, puberulous. 1824. A procumbent shrub.

B. linophylla (Flax-leaved).* *fl.* orange and purple. July to August. *l.* linear, with recurved margins. Branches compressed, leafy. *h.* 1ft. to 4ft. 1803. (B. M. 2491.)

B. microphylla (small-leaved). *l.* cuneiformly obcordate, glabrous. Branches terete, leafy, spinescent; young branches rather compressed and pubescent. *h.* 1ft. to 2ft. 1803. (L. B. C. 656.)

B. rhombifolia (diamond-leaved).* *fl.* yellow, the vexillum having a dark red zonate mark at the base; wings red at the base; keel brownish-purple. April. *l.* rhomboidal-orbicular, somewhat emarginate and mucronate. Branches terete; branchlets compressed, leafy. *h.* 1ft. to 3ft. 1820. SYN. *B. lenticularis.* (L. B. C. 1238.)

B. rotundifolia (round-leaved). *l.* roundish, or broadly obovate, somewhat mucronate, flat, four to five lines long and five to six broad. Branches and branchlets leafy, compressed. *h.* 1ft. to 2ft. 1824.

B. scolopendrium (plank-plant). *fl.* yellow, with the back of the vexillum and keel brownish-red. May. *l.* (when present) ovate and smooth. Branches flat, linear, leafless, toothed, with the teeth bearing the flowers; keel naked; superior bracts permanent, imbricate, equal in length to the peduncles. *h.* 3ft. to 10ft. 1792. (B. M. 1235.)

B. tenuicaulis (slender-stemmed). Synonymous with *B. cinerea.*

BOSWELLIA (named after Dr. Boswell, formerly of Edinburgh). Olibanum Tree. ORD. *Burseraceæ.* Ornamental and economic evergreen stove trees. Flowers hermaphrodite; calyx five-toothed, permanent; petals five, obovate-oblong, spreading, with the margins incumbent in æstivation; disk cup-shaped, crenate; stamens ten; capsule trigonal. They are of easy culture, thriving well in loam and peat soil. Cuttings root readily if placed in sand under a glass.

B. glabra (glabrous). *fl.* white, small, with a red nectary and yellow anthers; racemes aggregate, simple, terminal, shorter than the leaves. *l.* impari-pinnate; leaflets broad, lanceolate, blunt, serrated, smooth. *h.* 30ft. Coromandel, 1823. (B. F. S. 124.)

B. serrata (saw-edged-leaved).* *fl.* whitish-yellow; racemes axillary, simple. *l.* impari-pinnate; leaflets ovate-oblong, taper-pointed, serrated, pubescent. *h.* 20ft. India, 1820. (T. L. S. xv., 4.)

BOTANY BAY GUM. *See* **Xanthorrhœa arborea.**

BOTANY BAY TEA (and **TREE**). *See* **Smilax glycyphylla.**

BOTHY. A residence for under-gardeners, usually built behind the hothouses, or some high wall, in what is called a back shed. The place is too frequently a cramped, ill-ventilated hovel. A Bothy proper should be an independent structure, and fitted with modern conveniences; for, of all people, gardeners are the most susceptible to colds, &c. A library of standard horticultural and botanical works, as well as a few on other scientific subjects, and a moderate number of high-class books of fiction, one or more weekly gardening and other papers, should be supplied by the employer. During the winter months, for mutual improvement, lectures should be delivered, or papers read, by each gardener, on various subjects, after which a free discussion should take place upon the paper or lecture, by which means a great amount of good would be accomplished.

BOTRYCHIUM (from *botrys*, a bunch; in reference to the bunch-like disposition of the indusia). Moonwort. ORD. *Filices.* A genus of very interesting and pretty little hardy ferns. Capsules sessile, arranged in two rows on the face of spikes which form a compound panicle. They require a compost of sandy loam; perfect drainage is most essential. For general culture, *see* **Ferns.**

B. australe (southern). A variety of *B. ternatum.*

B. daucifolium (Daucus-leaved). *sti.* stout, 6in. to 12in. long; petiole of sterile segments 1in. to 6in. long, the latter 6in. to 12in. each way, deltoid, tripinnatifid or tripinnate, the lower pinnæ largest; segments lanceolate-oblong, ¼in. to ⅜in. broad, finely toothed. *fertile peduncle* equalling the sterile segments when mature; panicle 2in. to 4in. long; tripinnate, not very close. Himalayas, &c. Greenhouse species. SYN. *B. subcarnosum.*

B. Lunaria. Common Moonwort.* *sti.* 1in. to 4in. long. *sterile segments* sessile, or nearly so, 1in. to 3in. long, ½in. to 1in. broad, base much broader than the middle, cut down to a flattened

Botrychium—*continued.*

rachis into several distinct, close, entire, or notched cuneate-flabellate pinnæ on both sides. *fertile peduncle* equalling or exceeding the sterile portion; panicle close, 1in. to 2in. long. England, &c. Hardy. See Fig. 267.

FIG. 267. BOTRYCHIUM LUNARIA, showing Habit, Capsule, and Spores.

B. lunarioides (Lunaria-like). A variety of *B. ternatum.*

B. obliquum (oblique). A variety of *B. ternatum.*

B. subcarnosum (sub-fleshy). A synonym of *B. daucifolium.*

B. ternatum (ternate).* *sti.* 1in. to 2in. long. *petiole* of the

Botrychium—*continued.*

sterile segments 2in. to 4in. long, the latter 3in. to 6in. each way, deltoid, tri- or quadripinnatifid; lower pinnæ much the largest. *fertile peduncle* 6in. to 9in. long; panicle 1in. to 6in. long; deltoid, very compound. Nootka and Hudson's Bay territory. Several so-called species come very close to this, including *australe*, *lunarioides*, and *obliquum*, which are only geographical varieties. Greenhouse species.

B. virginianum (Virginian).* *sti.* 3in. to 18in. long. *sterile segments* sessile, 4in. to 12in. each way, deltoid, quadripinnatifid; lower pinnæ much the largest; pinnules oval-oblong, close, cut down to the rachis into finely cut linear-oblong segments. *fertile peduncle* equalling or exceeding the sterile part of the plant when mature; panicle 1in. to 4in. long, loose, oblong. Oregon, and North United States, 1790. A hardy species in sheltered places. (H. G. F. 29.)

BOTTLE-GOURD. *See* **Lagenaria.**

BOTTLE-TREE. *See* **Sterculia rupestris.**

BOTTOM HEAT. This is usually secured by passing hot-water pipes through an air chamber, or a water tank, beneath a bed of plunging material. The covering of the tank or chamber is best made of slate. The heat must be regulated according to the requirements of the subjects grown; this is easily accomplished by using the valve. A thermometer should be placed in the tank or bed. Bottom-heat is indispensable for propagating plants from seeds and cuttings, especially in spring. *See* **Heating** and **Hotbeds.**

BOUCEROSIA (from *boukeros*, furnished with buffaloes' horns; in reference to the curved lobes of the corona). ORD. *Asclepiadeæ*. A genus of greenhouse succulent perennials, allied to *Stapelia*, and requiring the same culture. Flowers numerous, terminal, umbellate; corolla sub-campanulate, five-cleft; segments broadly triangular, with acute recesses; stramineous corona fifteen-lobed; lobes disposed in a double series; the five inner ones opposite the stamens and lying upon the anthers; the rest exterior, erect, or a little incurved at apex, adhering to the back of the inner ones. Branches and stems tetragonal, with toothed angles.

FIG. 268. BOUCEROSIA EUROPÆA.

B. europæa (European). *fl.* purple-brown, yellow. Summer. *h.* 4in. Sicily, 1833. SYNS. *Apteranthes* and *Stapelia Gussoniana*. See Fig. 268. (B. R. 1731.)

B. maroccana (Morocco).* *fl.* dark red purple, with yellow concentric lines. Summer. *l.* minute, trowel-shaped, deflexed at tip of stem angles. *h.* 4in. Morocco, 1875. (B. M. 6137.)

BOUCHEA (named after C. and P. Bouche, German naturalists). ORD. *Verbenaceæ*. A small genus of stove or greenhouse evergreen herbs or sub-shrubs. Flowers subsessile, in spicate racemes, which are either terminal or in the forking of two branches; corolla funnel-shaped. Leaves opposite, toothed. They thrive in a well-drained compost of loam and sandy peat. Propagated by cuttings, placed in sand, under a glass, and in a gentle heat, during spring.

B. cuneifolia (wedge-shaped-leaved). *fl.* white. April. *h.* 4ft. Cape of Good Hope, 1821. A greenhouse evergreen shrub. SYN. *Chascanum cuneifolium.*

B. pseudogervao (false-gervaô). *fl.* purplish, with white throat; spike terminal, 6in. to 10in. long, slender. September. *l.* opposite, ovate, or elliptic-ovate, acuminate, serrated. Stems tetragonous. *h.* 2ft. to 5ft. Brazil, 1874. A stove perennial. (B. M. 6221).

BOUGAINVILLÆA (named after De Bougainville, a French navigator). ORD. *Nyctagineæ*. Gorgeous warm greenhouse or conservatory plants, comprising some of the most showy climbers in cultivation. Their beauty lies in

Bougainvillæa—*continued.*

the bracts, which envelop the small greenish flowers. *B. glabra* may be grown in pots, or planted out in the greenhouse borders; the others are best planted out, as

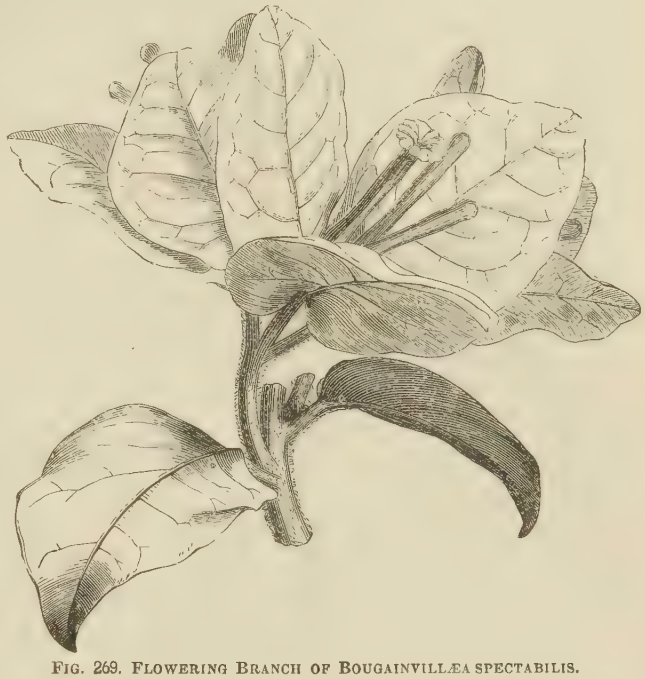


FIG. 269. FLOWERING BRANCH OF BOUGAINVILLÆA SPECTABILIS.

they root very freely, and plenty of space would be occupied if allowed, but it is best to limit it, as they flower much better. Strict training and pinching are not desirable, being prejudicial to the free production of blossom; indeed, the best plan is to allow the plants to ramble freely over the roof of a moderately high house, or along the upper portion of a back wall; they will then flower profusely for several months in the year, provided proper attention be paid to watering, and that the plants are in a well-drained situation. In preparing a border for their reception, the first point to be considered is the drainage, which must be perfect. This is best effected by placing a layer of brick rubbish, 6in. to 9in. in thickness, communicating with the drain, by which means all sourness and stagnancy of the soil will be obviated. The bed should be excavated to a depth of 18in. or 2ft. Three parts turfy loam, and one part leaf soil, with the admixture of a liberal quantity of sharp gritty sand, will form a suitable compost for the culture of Bougainvillæas. The amount of sand incorporated must depend upon the quality of the other components, heavy loam requiring more than that which is more friable. The occasional incorporation of manure in the compost is not to be recommended; but a liberal application of liquid manure will be of material advantage, especially if the root space is limited. When the plants cease flowering each year—about November or December—they should be dried off and rested; and in February they should be closely spurred in, the same as with vines, and all weak leaders removed, so that strong wood only is left. When grown in pots, they must be started in brisk heat. They are easily increased by cuttings prepared from the half-ripened wood; these should be placed in sandy soil, in a brisk bottom heat, when they will soon root. Scale, red spider, and mealy bug are the only insects likely to infest the plants, and recipes for their destruction will be found under each individual name.

B. glabra (smooth).* *fl.*, inflorescence panicled, smaller than that of *B. speciosa*, each branchlet producing cordate-ovate acute rosy

Bougainvillæa—*continued.*

bracts, in threes. Summer. *l.* bright green, smooth. Brazil, 1861. This is by far the best species for pot culture, and forms a very showy plant when well grown.

B. speciosa (beautiful).* *fl.*, bracts large, cordate, delicate lilac rose, produced in immense panicles, which, in well grown specimens, are so freely produced as to entirely shroud the whole plant. March to June. *l.* ovate, very dark green, covered on the upper surface with small hairs. Stems branched, abundantly furnished with large recurved spines. Brazil, 1861. (F. M. i., 62.)

B. spectabilis (showy). *fl.*, bracts of a dull brick-red, shaded with scarlet. South America, 1829. It is very difficult to obtain bloom on this plant; and when flowers are produced, they are extremely ephemeral. The species is, for all practical purposes, much inferior to either of the foregoing. SYN. *Josepha augusta.* See Fig. 269.

BOURBON PALM. *See* **Latania.**

BOUSSINGAULTIA (named after Boussingault, a celebrated chemist). ORD. *Chenopodiaceæ.* Very pretty half-hardy, tuberous-rooted plants, requiring a rich vegetable sandy soil, and a well-drained sunny aspect, under which conditions the first-mentioned species develops into a very luxuriant trailing plant, attaining a length of 20in. or more. Propagated freely by means of the tubercles of the stem; these are, however, extremely brittle.

B. baselloides (Basella-like).* *fl.* white, ultimately becoming black, fragrant, small, disposed in clusters, 2in. to 4in. long, which are axillary at the ends of the branches. Late autumn. *l.* alternate, cordate, smooth, shining, fleshy, slightly wavy. Stems very twining, tinged red, very quick-growing, producing tubercles. South America, 1835. (B. M. 3620.)

B. Lachaumei (Lachaume's). *fl.* rose, constantly in perfection. Cuba, 1872. A stove species.

BOUVARDIA (named after Dr. Charles Bouvard, formerly superintendent of the Jardin du Roi, at Paris). ORD. *Rubiaceæ.* Handsome greenhouse evergreen shrubs. Peduncles terminal, three-flowered, or trichotomous and corymbose; corolla funnel-shaped, tubular, elongated, beset with velvety papillæ outside, and a four-parted, spreading, short limb. Leaves opposite, or in whorls; stipules narrow, acute, adnate to the petioles on both sides. These extensively cultivated plants are among the most useful

FIG. 270. FLOWERING BRANCH OF BOUVARDIA.

for conservatory or greenhouse decoration (see Fig. 270, for which we are indebted to Messrs. Cannell and Sons), and the flowers are largely employed in a cut state. Perhaps only two are fragrant, viz., *jasminiflora* and

Bouvardia—*continued.*

Humboldtii. Cultivation: Presuming the grower to be commencing with young rooted cuttings, these should be potted off into a mixture of good fibrous loam, leaf soil, and sand, in equal proportions, to which may be added a small quantity of peat; they should then be placed in a temperature of from 70deg. to 80deg. until fully established in the small pots. It is necessary at this stage to stop the young plants back to the first joint, and as they continue to make fresh breaks, to keep on pinching them back during the whole period of cultivation, or until sufficiently bushy plants are produced. Many growers neglect stopping far too much, the result being ill-shaped and almost flowerless plants. The pinching, of course, can be regulated by the time the plants are required to flower; and it is unwise, in most cases, to stop them after the end of August. When the small pots are well filled with roots, the plants should be shifted into the flowering pots, viz., large 48-sized, which are quite commodious enough to grow very fine plants, a similar compost as in the first potting, with a little Standen's manure added, being used, and good drainage provided. A cool greenhouse, with a damp bottom for the pots to rest upon, and with a moist atmosphere, is the most suitable place in which to grow them during late spring and early summer, the moist air being very desirable as an effectual check to red spider, a pest very fond of the foliage, which it permanently disfigures. A cold pit or close frame is better during the summer months, as a moist atmosphere and cool bottom are then certain. Ventilation may be effected during the greater part of the day by tilting the lights below, and on fine nights they may be removed altogether. During bright sunshine, shading will be beneficial. All through the period of active growth, it is absolutely necessary that the plants should receive plenty of water, or they will surely suffer; and when the pots are filled with roots, occasional doses of manure water will be beneficial. Many cultivators plant them out about the end of June, in favoured situations, or in spent hotbeds, when they make very vigorous growth; and, if carefully pinched and watered, fine specimens are obtained. These are lifted in early autumn, with a good ball, potted, and kept shaded for a few days until the roots are again active, when they are taken to the house in which they are intended to bloom, and an enormous supply of flowers is secured. We have also seen Bouvardias planted out permanently in beds, in prepared pits, in which the winter temperature was not less than 55deg., with very satisfactory results; the quantity of bloom being very great. Of course, with the last-named treatment, it is essential to give the plants a rest and hardening-off after flowering, and when they are started into fresh growth to keep them well pinched and watered. Bouvardias are liable to the attacks of red spider and green fly. The former stands little chance of existence if the plants are kept well supplied with moisture; the latter may be destroyed by fumigating with tobacco. Mealy bug are also troublesome, and should be sponged off with a solution of Gishurst's Compound. Propagation: After flowering, and a slight rest and hardening-off, the old plants should be cut back, placed in heat, in a stove or cucumber pit, and freely syringed, which will cause them to break freely, and produce a good supply of cuttings. When the young shoots are from 1½in. to 2in. long., they are in the best condition for striking. It is not necessary that they should be cut off at a joint, as they will root from any surface of the stem; and, working economically, it is wiser to cut them off just above the first joint, as other shoots will speedily break out, which may, in their turn, be taken. Pots about 5in. across should have previously been prepared for the cuttings, by being well drained and filled with a mixture of good fibrous loam, leaf soil, and coarse sand, in equal parts, with a copious supply of sand upon the surface, into which the cuttings should be dibbled pretty thickly. A good

Bouvardia—*continued.*

watering must be given without wetting, and thereby injuring, the foliage. The pots should be plunged in the cutting case, or in any bottom heat of about 70deg. or 80deg., and covered with a bell glass. All that is then necessary is to keep them moist and shady during sunshine, until they are rooted, which, as a rule, is effected in three weeks' time. When well established, they may be removed from the case, gradually hardened off, and finally potted singly into small thumb pots.

B. angustifolia (narrow-leaved).* *fl.* pale red; corymbs somewhat trichotomous. September. *l.* three in a whorl, lanceolate, with revolute edges, glabrous above, but beset with fine hairs beneath. Branches terete, smoothish. *h.* 2ft. Mexico, 1838. (P. M. B. 7, 99.)

B. Cavanillesii (Cavanilles's). *fl.* red; peduncles terminal, trifid, three-flowered. May. *l.* opposite, ovate-lanceolate, acuminated, rather villous beneath. *h.* 1½ft. Mexico, 1846. SYN. *B. multiflora.* (J. H. S. 3, 246.)

B. flava (yellow).* *fl.* yellow, drooping; racemes three to five-flowered; pedicels downy, slender. March. *l.* opposite, ovate-lanceolate, ciliated; stipules setaceous. *h.* 1½ft. Mexico, 1845. (B. R. 32, 32.)

B. hirtella (hairy). *fl.* pale red or flesh-coloured, corymbose. *l.* whorled, lanceolate, with revoluted edges, hairy on both surfaces. Branches terete. Mexico.

B. Humboldtii corymbiflora (Humboldt's corymb-flowered).* *fl.* white, large, fragrant, disposed in terminal racemes; tubes long. Autumn and winter. *l.* ovate, oblong-acuminate, dark green. 1874. One of the finest kinds in cultivation. (G. C. 1873, 717.)

B. Jacquini (Jacquin's). A synonym of *B. triphylla.*

B. jasminiflora (Jasmine-flowered).* *fl.* white, fragrant, in compound cymes; very floriferous. Winter. *l.* opposite, elliptic-acuminate. South America, 1869. A very charming and largely grown species. (G. C. 1872, 215.)

FIG. 271. BOUVARDIA LEIANTHA.

B. leiantha (smooth-flowered).* *fl.* scarlet; corymbs sub-trichotomous. July to November. *l.* ternate, ovate-acuminate, slightly hairy above, downy-villous beneath. *h.* 2ft. Mexico, 1850. See Fig. 271. (B. H. 2, 6.)

B. longiflora (long-flowered).* *fl.* white, terminal, solitary, sessile, with the tube 2in. or 3in. long. *l.* opposite, oblong, acute, cuneated at the base, glabrous. Branches compressedly tetragonal, glabrous. *h.* 2ft. to 3ft. Mexico, 1827. (B. M. 4223.)

B. multiflora (many-flowered). A synonym of *B. Cavanillesii.*

B. triphylla (three-leaved).* *fl.* scarlet, nearly 1in. long; corymbs somewhat trichotomous. July. *l.* smoothish above, hairy beneath, three in a whorl, oblong. Branchlets trigonal, hairy. *h.* 2ft. to 3ft. Mexico, 1794. There are numerous varieties of this species. SYN. *B. Jacquini.* (B. M. 1854.)

B. versicolor (various-coloured). *fl.*, corolla with a scarlet tube, which is ¾in. long, but having the limb yellowish inside; corymbs three-flowered, trichotomous, drooping. July to September. *l.* opposite, lanceolate, ciliated. Branches terete, glabrous, velvety while young. *h.* 2ft. to 3ft. South America, 1814. (B. R. 245.)

The garden hybrids are very handsome. A selection is given below:

ALFRED NEUNER, flowers double, white, or slightly tinged with rose (see Fig. 272); BRILLIANT, flowers bright crimson, numerous, freely branching habit, and strong constitution; DAZZLER,* habit very bushy and compact, extremely floriferous, flowers rich scarlet, in dense clusters; HOGARTH, brilliant scarlet, very fine; LONGIFLORA FLAMMEA,* flowers long-tubed, blush-rose; MAIDEN'S

FIG. 272. BOUVARDIA ALFRED NEUNER.

BLUSH,* very free and floriferous, blush-rose; PRESIDENT GARFIELD, rich double, red-pink, very fine; QUEEN OF ROSES, rosy-pink, the tubes tinted with crimson, habit dwarf and very free; VREELANDI (=DAVIDSONI), flowers pure white, produced in great abundance; one of the most useful of them all, and grown very extensively.

BOWENIA (commemorative of Sir G. Bowen, Governor of Queensland). ORD. *Cycadaceæ.* A remarkable and handsome greenhouse Fern-like plant, closely allied to *Zamia*, from which it is distinguished by having the leaflets decurrent to the petiole, instead of articulated, as in that genus. For culture, *see* **Cycas.**

B. spectabilis (showy).* *fl.*, male cones small, ovoid, ½in. to ¾in. long; female oblong-globose, 3½in. long. *l.* bipinnatisect, on tall, slender petioles; leaflets falcate-lanceolate, decurrent; stem short, thick, cylindrical. Queensland, Australia, 1863. (B. M. 5398 and 6008.)

Bowenia—*continued.*

B. s. serrulata (finely-toothed).* This differs from the type in having the margins distinctly toothed or serrated. Rockingham Bay, 1863.

BOWIEA (named after J. Bowie, a botanical collector for the Royal Gardens, Kew). ORD. *Liliaceæ*. A very interesting greenhouse or half-hardy twining bulbous

FIG. 273. BOWIEA VOLUBILIS, showing Habit, Flower, and Fruit.

perennial, thriving in a sunny border, under the wall of a greenhouse, where it will require protection during winter. It does well in any light well drained soil, and may be propagated by seeds or offsets.

B. volubilis (twining). *fl.* few, remote, pedicellate; perianth six-partite, persistent; segments equal, green, lanceolate, ¼in. long, at length reflexed. October. True leaves are frequently not developed for years; but the green, fleshy, mostly abortive inflorescence performs their functions. South Africa, 1866. See Fig. 273.

BOX. *See* **Buxus.**

BOX ELDER. *See* **Negundo.**

BOX THORN. *See* **Lycium.**

BRABEIUM (from *brabeion*, a sceptre; in reference to the racemosed flowers). African Almond. ORD. *Proteaceæ*. An ornamental greenhouse evergreen tree. For culture, &c., *see* **Banksia.**

B. stellatifolium (star-leaved). *fl.* white, sweet-scented, disposed in elegant, axillary, spiked racemes. August. *l.* whorled, simple, serrate. *h.* 15ft. Cape of Good Hope, 1731.

BRACHYCHITON (from *brachys*, short, and *chiton*, a coat of mail; plants covered with imbricated hairs and scales). ORD. *Sterculiaceæ*. A genus of tropical or subtropical Australian trees or shrubs, allied to *Sterculia*, from which it differs in very minor points. They are of easy culture in a loamy soil. Propagated by young cuttings, planted in sandy soil, in gentle heat.

B. acerifolium (Acer-leaved). *fl.* bright red. *l.* long-stalked, deeply five to seven-lobed. *h.* from 60ft. to 120ft.

B. Bidwillii (Bidwill's).* *fl.* bright red, arranged in axillary bunches. *l.* stalked, heart-shaped, entire, or three-lobed, and covered with a soft pubescence. 1851. (B. M. 5133.)

B. diversifolium (various-leaved). *l.* coriaceous, obtuse, lanceolate, entire, or three-lobed, glabrous; lobes acuminate. *h.* 20ft. to 60ft. 1824.

BRACHYCOME (from *brachys*, short, and *kome*, hair). Swan River Daisy. ORD. *Compositæ*. A genus of beautiful little half-hardy perennials or annuals, closely resembling *Bellis* in structure. Involucral bracts membranous at the margin; receptacle pitted, naked. Fruit compressed, surmounted by a very short bristly pappus. *B. iberidifolia* is one of the prettiest of summer annuals, and in the open border it flowers profusely, if in a dry,

Brachycome—*continued.*

sunny spot. Towards the autumn, it may be removed to the greenhouse, where it will still continue flowering for several weeks. Seeds may be sown in a gentle hotbed, early in the spring, and, when large enough, planted out in borders or beds, 6in. apart; or they may be sown thinly out of doors, late in April, and thinned out, when they will flower a month later than those sown in the hotbed.

B. iberidifolia (Iberis-leaved).* *fl.-heads* blue or white, with a dark centre, about 1in. in diameter. Summer and autumn. *l.* pinnate; segments linear. Plant erect, glabrous. *h.* 1ft. Swan River, 1843. See Fig. 274.

FIG. 274. BRACHYCOME IBERIDIFOLIA, showing Habit and Flowering Branch.

BRACHYLÆNA (from *brachys*, short, and *læna*, a cloak or covering; referring to the shortness of the involucre). ORD. *Compositæ*. A genus of South African evergreen greenhouse shrubs, nearly allied to *Baccharis*. They thrive in a compost of peat and loam. Propagated by cuttings, made of half-ripened shoots, placed in a well-drained pot of sandy soil, under a bell glass.

B. dentata (toothed). *fl.-heads* yellow. *l.* lanceolate, acute, entire, rusty beneath when young, when adult quite glabrous.

B. nerifolia (Nerium-leaved).* *fl.-heads* yellow, in branching racemes or panicles. August to November. *l.* lanceolate, serrated with one or two teeth forward. *h.* 2ft. Cape of Good Hope, 1752.

BRACHYOTUM (from *brachys*, short, and *otos*, the ear; in reference to the short appendages at the base of the anthers). ORD. *Melastomaceæ*. A handsome greenhouse evergreen shrub, with a bushy habit. Allied, and requiring similar culture, to **Pleroma** (which *see*).

B. confertum (crowded).* *fl.* purple, terminal, nodding, with cream-coloured bracts. November. *l.* oblong or ovate, small, three-nerved, with adpressed hairs. Andes, Peru, 1873. (B. M. 6018.)

BRACHYSEMA (from *brachys*, short, and *sema*, a standard; the standard of the flower is very short). ORD. *Leguminosæ*. Elegant procumbent or climbing greenhouse, evergreen shrubs. Racemes axillary and terminal, few-flowered. Leaves alternate, oval or ovate, entire, mucronate, silky on the under surface. They thrive in a compost of peat, leaf soil, and loam, in equal proportions, made porous, if necessary, by the addition of sand. Increased by cuttings, made of half-ripened shoots in summer, placed in sandy soil, under a bell glass, in a gentle bottom heat; or by layers. Seeds may be sown in March, in heat. Brachysemas require thorough drainage, whether grown in pots or planted out. *B. latifolium* does best under the latter treatment, when it forms a magnificent climber for pillars or the roof.

B. lanceolatum (lanceolate-leaved). *fl.* rich scarlet, with the margin of the vexillum white, red at the disk, with a large yellow spot in the centre, each about 1in. long, disposed in axillary,

Brachysema—*continued.*

sub-compound racemes. *l.* opposite, rarely alternate, ovate or ovate-lanceolate, entire, silky white beneath. *h.* 3ft. Swan River, 1848. (B. M. 4652.)

B. latifolium (broad-leaved).* *fl.* crimson-scarlet, large; vexillum oblong-ovate. April. *l.* ovate, flat, silky beneath. New Holland, 1803. A handsome climber. (B. R. 118.)

B. melanopetalum (black-petaled). Synonymous with *B. undulatum.*

B. undulatum (undulated).* *fl.* deep violet-maroon, solitary or twin; vexillum oblong, cordate, convolute, and bluntish above. March. *l.* oblong-ovate, mucronate, undulated. New South Wales, 1820. A tall sub-scandent plant. SYN. *B. melanopetalum.* (B. R. 642.)

BRACHYSPATHA (from *brachys*, short, and *spatha*, a spathe; the spathe is much shorter than the spadix). ORD. *Aroideæ* (*Araceæ*). A stove tuberous perennial, allied to, and requiring the same cultivation as, **Amorphophallus** (which *see*).

B. variabilis (variable).* *fl.* exhaling an abominable fœtor, which is, however, of very short duration; spathe much shorter than the spadix, greenish-purple, sharply acuminate, and many-nerved; spadix whitish, with female flower at the base, and above contiguous to them are the males without any intermediate neutral flowers; anthers orange red; the naked apex of the spadix is very long, wrinkled, and pitted on the surface. *l.* solitary, 18in. across; the spotted petiole divides at the top into three main divisions, each of which is again forked and deeply pinnately cut; the segments alternate, sessile, or decurrent, very unequal in size, ovate or oval-lanceolate, acuminate, glabrous, shining. *h.* 3ft. India, 1876. (G. C. 1876, 129.)

BRACHYSTELMA (from *brachys*, short, and *stelma*, a crown; in reference to the short coronal processes of the flowers). ORD. *Asclepiadeæ.* Extremely curious little suffruticose, tuberous, twining, greenhouse perennials. Corolla campanulate, having angular sinuses; corona simple, five-cleft, lobes opposite the anthers, simple on the back. Leaves opposite, membranous. They thrive best in fibry loam. Propagated by cuttings, which will root in sandy soil, in heat; also by divisions of the root.

B. Arnotti (Arnott's). *fl.* brown, green. *l.* in opposite pairs, nearly sessile, crisped, ovate, dull green above, densely grey, pubescent beneath. *h.* 4in. South Africa, 1868. (Ref. B. i., 9.)

B. Barberæ (Mrs. Barber's). *fl.* dingy purple, speckled with yellow. August. *l.* large, linear-oblong, acute. *h.* 6in. South Africa, 1866. (B. M. 5607.)

B. ovata (ovate-leaved). *fl.* yellowish-green. *l.* ovate, shortly-stalked, pubescent. *h.* 1ft. South Africa, 1872. (Ref. B. 226.)

B. spathulatum (spathulate-leaved). *fl.* green. June. *l.* spathulate, oblong, hairy. *h.* 1ft. Cape of Good Hope, 1826. (B. R. 1113.)

B. tuberosum (tuberous). *fl.* purple. June. *l.* linear-lanceolate, ciliate. *h.* 1½ft. Cape of Good Hope, 1821. (B. M. 2343.)

BRACKEN, or BRAKE FERN. *See* **Pteris aquilina.**

BRACTEATE. Having bracts.

BRACTEOLATE. Having secondary bracts between the true bracts and the flowers.

BRACTS. Modified leaves placed near the calyx on the peduncle or pedicel.

BRAHEA (named after Tycho Brahe, the celebrated astronomer). ORD. *Palmæ.* A small genus of dwarf Palms, with fan-shaped leaves, and hermaphrodite, greenish flowers. They require rich light loam and fibrous peat, in equal parts, to which may be added a good portion of washed sand; thorough drainage and liberal supplies of water are also absolutely necessary. Propagated by seeds. During summer, they may be removed to the greenhouse, and can be employed with much success for sub-tropical gardening.

B. dulcis (sweet).* *l.* nearly circular, bright shining green; petioles clothed with woolly tomentum, armed at the edges with small close-set spines, and enveloped at the base in a network of brown fibre. Stem stout. Mexico, 1865. A rare and slow developing species.

B. filamentosa (filamentose). A synonym of *Washingtonia filifera.*

BRAINEA (commemorative of C. J. Braine, Esq., of Hong Kong, China). ORD. *Filices.* Sori continuous along transverse veins, near the midrib, and also produced along the veins in the direction of the edge of the frond.

Brainea—*continued.*

B. insignis (remarkable), which is the only species, has a *trunk* 3in. to 4in. thick; scales linear, nearly 1in. long. *sti.* firm, 3in. to 4in. long, scaly only at the base. *fronds* 2ft. to 3ft. long, 8in. to 12in. broad, simply pinnate; pinnæ close, numerous, linear, finely serrated. Hong Kong, 1856. A very handsome and interesting greenhouse tree fern, requiring a soil of loam and peat, in equal parts, with the addition of some sharp sand, and thorough drainage.

BRAMBLE. *See* **Rubusfruticosus.**

BRASSAVOLA (named in honour of A. M. Brassavola, a Venetian botanist). ORD. *Orchideæ.* A genus of epiphytal Orchids, requiring the heat of an intermediate house. Flowers large, usually with narrow acuminate greenish petals and sepals, and a white lip, which is sometimes broad; column having a pair of great falcate ears on each side of the front, and eight pollen masses. Leaves solitary, succulent. They are of easy culture on blocks of wood, with a little moss, suspended from the roof. Water should be plentifully given during the growing season; at other times, a very small quantity will suffice. About seventeen or eighteen species have been introduced, of which the following only are worth growing:

B. acaulis (stemless). *fl.* large; sepals and petals long, narrow, greenish and creamy-white; lip large, heart-shaped, and pure white; base of tube spotted with dull rose. September. *l.* very narrow, Rush-like. *h.* 4in. Central America, 1852. (P. F. G. ii., 152.)

B. Digbyana (Digby's).* *fl.* solitary, 4in. across, produced from the top of the bulb; sepals and petals creamy-white; lip same colour, streaked with purple down the centre, and beautifully fringed. Winter. *h.* 9in. Honduras, 1844. A compact-growing evergreen. (B. M. 4474.)

B. Gibbsiana (Gibbs's).* *fl.* white, spotted with chocolate, large, three on each spike. *l.* rather broad and very thick. This rare, erect-growing species must be potted in peat and sphagnum.

B. glauca (glaucous).* *fl.* solitary, produced from a sheath at the top of the bulb; sepals and petals yellow; lip orange, with a white throat. Early spring. *l.* of a milky-green. *h.* 1ft. Vera Cruz, 1837. A very handsome fragrant species, somewhat difficult to flower, but this obstacle may be overcome by liberally growing during the proper season, and giving it a severe dry rest. (B. M. 4033.)

B. lineata (lined).* *fl.* large, very fragrant; sepals and petals creamy-white; lip large, pure white. *l.* long, terete, channelled above, tapering to a point, very deep green. South America, 1850. (B. M. 4734.)

B. venosa (veined).* *fl.* small and compact; sepals and petals cream coloured; lip white, strongly veined. A pretty free flowering species. Honduras, 1839. (B. R. 26, 39.)

BRASSIA (named after Mr. William Brass, who was sent by Sir Joseph Banks to Cape Coast and the neighbouring districts as a botanical collector, at the end of the last century). ORD. *Orchideæ.* A genus of tropical American Orchids, very nearly allied to *Oncidium*, with which, indeed, Reichenbach unites it. From this genus, however, *Brassia* may be distinguished by its simple inflorescence, elongated tail-like sepals, and short column, which is quite destitute of the side lobes or ears that form a marked feature in the species of *Oncidium.* There are about seventeen species, of which many are not sufficiently attractive to deserve the cultivator's attention. They will succeed either in pots or in baskets, the drainage of which must be perfect. They require to be potted in good fibrous peat, broken in pieces not less in size than a walnut, placed in the warm end of a Cattleya or Brazilian house, and supplied liberally with water during summer. In winter, they must still be kept in a tolerably warm place, and given sufficient water to keep the pseudo-bulbs from shrivelling. It is useless to dry off until shrivelling takes place, for experience assures us that when a plant shrivels it is generally safe to assume that it has been tried beyond its powers of endurance, and that its constitution has given way. Propagated by dividing the plants, when growth has commenced.

B. antherotes (brilliant).* *fl.* 7in. in diameter from tip to tip of the sepals; sepals and petals yellow, brownish-black at the base, narrow, ¼in. broad, tapering; petals 1½in. long; lip triangular, yellow, barred with brown; spike strong, about 2ft. in length. Tropical America, 1879.

Brassia—*continued.*

B. caudata (tailed).* *fl.*, sepals and petals yellow, barred with brown, from 4in. to 6in. long; lip broad and yellow, spotted with greenish-brown. When the plant is large and healthy, it produces numerous drooping spikes, 18in. long, and many-flowered. *h.* 1ft. West Indies, 1823. (B. R. 832.)

B. Gireoudiana (Gireoud's). *fl.*, sepals and petals bright yellow, spotted and blotched with deep red, produced in many-flowered scapes of singular and beautiful flowers during spring and early summer. This species much resembles *B. Lanceana*, but has larger flowers Costa Rica. (R. X. O. 1, 32.)

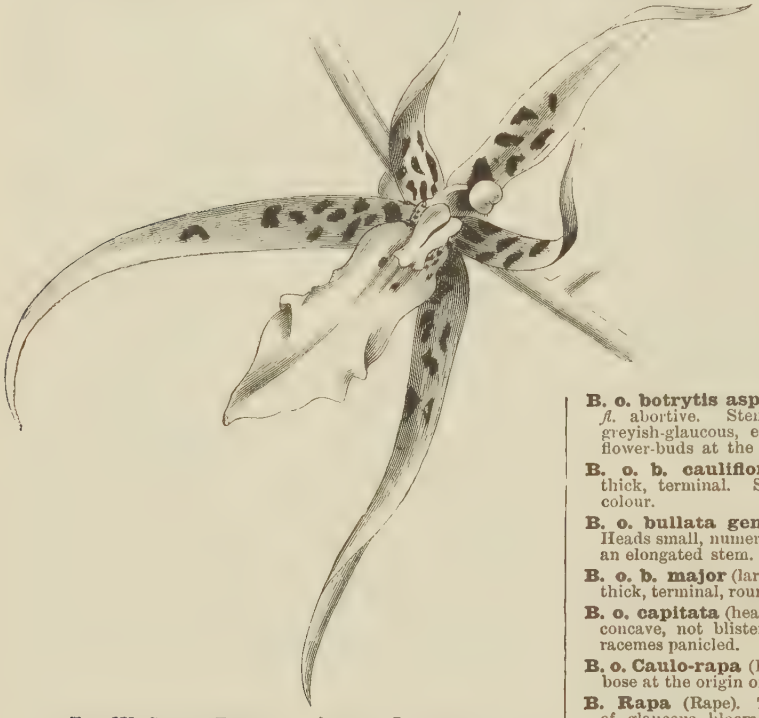


FIG. 275. SINGLE FLOWER OF BRASSIA LANCEANA.

B. Lanceana (Lance's).* *fl.*, sepals and petals lanceolate and tapering, bright yellow, blotched with brown, or sometimes with deep red; lip wholly yellow, slightly spotted at the base, and much waved, deliciously fragrant; scapes radical, many-flowered. In the typical species, the lip is rather more than half as long as the sepals. *l.* rich dark green. *h.* 9in. Surinam, 1843. See Fig. 275. (B. R. 1754.)

B. L. macrostachya (large-spiked).* *fl.*, sepals and petals bright rich yellow, sparingly spotted with brown, as in the type; sepals lengthened out into tail-like appendages, which are sometimes nearly 5in. in length; lip wholly of a clear pale yellow. Demerara.

B. L. pumila (dwarf). *fl.*, sepals pale yellow, without spots or markings; petals of the same colour, tinged with purple near the base; lip about half the length of the sepals, slightly contracted in the middle, yellow, with a brownish-yellow base. Caraccas.

B. Lawrenceana (Lawrence's).* *fl.* large, sweet-scented; sepals and petals bright yellow, spotted with cinnamon and green; lip yellow, tinged with green. June to August. *h.* 1ft. Brazil, 1839. (B. R. 27, 18.)

B. L. longissima (long-sepaled).* *fl.*, sepals deep orange-yellow, blotched and spotted, especially towards the base, with reddish-purple, and lengthened out into tail-like appendages, which, in well-grown examples, measure 7in. in length; petals about 2½in. long and ½in. broad at the base, marked in the same manner as the sepals; lip about 3in. long, pale yellow, dotted and spotted towards the base with purple. August and September. Costa Rica, 1868. A magnificent variety.

B. maculata (spotted).* *fl.* large; sepals and petals pale yellow, irregularly spotted with brown; the former being short compared with those of the other species; lip white, spotted about and below the centre with brown and purple. Spring and early summer. Jamaica, 1806. See Fig. 276. (B. M. 1691.)

B. m. guttata (spotted).* *fl.* on spikes 2ft. or 3ft. long; sepals and petals yellowish-green, blotched with brown; lip broad, yellow, spotted with brown. May to August. Guatemala, 1842. SYN. *B. Wrayæ.* (B. M. 4003.)

Brassia—*continued.*

B. verrucosa (warty-lipped).* *fl.* large; sepals and petals greenish, blotched with blackish-purple; lip white, ornamented with numerous little green protuberances or warts, hence the specific name; scape many-flowered. May and June. Guatemala.

B. v. grandiflora (large-flowered).* *fl.* twice the size of, and a lighter colour than, the type. This variety is very rare, and is said to be the best of the genus.

B. Wrayæ (Wray's). A synonym of *B. maculata guttata.*

BRASSICA (old Latin name used by Pliny; from *Bresic*, the Celtic name for Cabbage). Cabbage. ORD. *Cruciferæ.* Herbaceous, usually biennial, rarely annual or perennial, or suffrutescent plants, usually with a short caudex. Flowers yellow, rarely white, but never purple nor veined. Radical leaves usually stalked, lyrate, or pinnatifid; cauline ones sessile or stem-clasping, entire; racemes elongated; pedicels bractless, filiform. Full cultural details will be found under the popular garden name of each variety.

B. oleracea (herb-like). *fl.* pale yellow, large. May and June. *l.* glaucous, waved, lobed, smooth. Root-stem cylindrical, fleshy. *h.* 1ft. to 3ft. England. Biennial.

B. o. acephala (headless). Borecole or Kale. Stem round, elongated. *l.* expanded; racemes panicled.

B. o. botrytis asparagoides (Asparagus-like). The Broccoli. *fl.* abortive. Stem taller than that of the Cauliflower. *l.* greyish-glaucous, elongated. Branchlets fleshy, bearing small flower-buds at the top.

B. o. b. cauliflora (Cauliflower). Heads of flower-buds thick, terminal. Stem short. *l.* oblong, of a greyish-glaucous colour.

B. o. bullata gemmifera (bud-bearing). Brussels Sprouts. Heads small, numerous, rising from the axils of the leaves along an elongated stem.

B. o. b. major (larger). Savoy Cabbage. Heads of leaves loose, thick, terminal, roundish. *l.* blistered.

B. o. capitata (headed). The Cabbage. Stem round, short. *l.* concave, not blistered, crowded into a head before flowering; racemes panicled.

B. o. Caulo-rapa (Kohl-Rabi). Stem tumid and somewhat globose at the origin of the leaves.

B. Rapa (Rape). The Turnip. Radical leaves lyrate, destitute of glaucous bloom, green, covered with bristly hairs; middle cauline ones cut; upper ones quite entire, smooth.

FIG. 276. SINGLE FLOWER OF BRASSIA MACULATA.

BRASSICACEÆ. *See* **Cruciferæ.**

BRAVOA (named after Bravo, a Mexican botanist). ORD. *Amaryllideæ.* A pretty little graceful bulbous

Bravoa—*continued.*

plant, hardy in very sheltered positions, but in exposed situations requiring a slight protection in winter. It is an admirable plant for cool-house culture, and delights in a compost of light rich loam, leaf mould, and sand. Propagated by offsets, which are obtainable in autumn; or by seeds, which should be sown as soon as ripe.

B. geminiflora (twin-flowered).* Twin Flower. *fl.* rich orange-red, tubular, drooping, disposed in the upper part of the flower-stems, which are sometimes 2ft. long. July. *l.* linear, ensiform, pale green. Mexico, 1841. (B. M. 4741.)

BRAZILIAN TEA. *See* **Ilex paraguariensis** and **Stachytarpheta jamaicensis.**

BRAZIL NUT. *See* **Bertholletia.**

BRAZIL WOOD. *See* **Cæsalpinia brasiliensis.**

BREAD FRUIT. *See* **Artocarpus.**

BREAD NUT. *See* **Brosirium.**

BREDIA (named in honour of Professor J. G. S. van Bred). ORD. *Melastomaceæ.* An ornamental greenhouse shrub, thriving in rich light loam, leaf soil, and peat. Propagated by cuttings of the ripened shoots, inserted in sandy loam, under a hand glass, in heat; or by seeds.

B. hirsuta (hairy).* *fl.* rose-pink, about ½in. across, disposed in loose, terminal, many-flowered cymes. Autumn. *l.* ovate acuminate, hairy. Japan, 1870. (B. M. 6647.)

BREEZE. The small particles or refuse of gas coke. It constitutes a very cheap fuel, but, unless mixed with good coke, is only suitable for boilers of the saddle type, having a good draught. Breeze must not, however, be confounded with coke-dust.

BREVOORTIA COCCINEA. *See* **Brodiæa coccinea.**

FIG. 277. FLOWERING BRANCH OF BREXIA MADAGASCARIENSIS.

BREXIA (from *brexis*, rain; the large leaves afford protection against rain). ORD. *Saxifrageæ.* Excellent stove trees. Flowers green, in axillary umbels, surrounded by bracts on the outside. Leaves alternate, simple, dotless, and furnished with minute stipules. Stems nearly simple. They require a compost of two parts loam and one of peat, with the addition of a little sand, to keep the whole open. A liberal supply of water must be given at all seasons.

Brexia—*continued.*

Cuttings, with their leaves not shortened, strike readily in sand under a hand glass, in heat; or a leaf taken off with a bud attached will grow. Leaves as in accompanying illustration (Fig. 277), and long, narrow, spiny-toothed ones, are often produced on the same plant. Probably the two species enumerated below are simply forms of one. Well hardened off, strong growing plants of *B. madagascariensis* are very suitable for sub-tropical gardening.

B. madagascariensis (Madagascar).* *l.* obovate or oblong, entire, while young minutely gland-toothed. *h.* 20ft. Madagascar, 1812. See Fig. 277.

B. spinosa (spiny). *l.* lanceolate, 20in. long, 2in. broad, spiny-toothed. *h.* 20ft. Madagascar, 1820.

BREXIACEÆ. A section of *Saxifrageæ.*

BRIAR. *See* **Rosa.**

BRICKS. In England, the standard thickness of brick walls is a Brick and a-half, that is, the length of one brick and the breadth of another. Thirty-two paving bricks, laid flat, will form one square yard of flooring; if set on edge, sixty-four will be required for the same space. The best Bricks for walls are those termed Stocks, which are well burnt. Grizzells and Place Bricks, being only partially burnt, are soft and not durable. In various parts of the kingdom, different clays and methods of manufacture cause a disparity in the weight and appearance of the finished article. Several forms are made to suit various purposes, but the standard size is 9in. long by 4½in. wide, by 2½in. thick, although, since the remission of the duty, some slight variations occur, owing to shrinkage and other causes. Fire Bricks are made of a particular kind of clay, which will stand intense heat when once burnt, and are used in furnaces and other places where durability under great heat is a desideratum. Fire-clay should always be used in place of mortar in building with these.

BRILLANTAISIA (named after M. Brillant). ORD. *Acanthaceæ.* A very small genus of erect, branching, stove evergreen shrubs. Flowers large, in terminal panicles; corolla ringent; upper lip falcate and overarching, with a trifid apex, the lower one large, spreading, shortly trifid. Leaves ovate-cordate, on long petioles. For culture, *see* **Barleria.**

B. owariensis (Owarian).* *fl.* violet-blue; cymes sub-sessile, loose; panicles terminal. March. *l.* large, opposite, petiolate. *h.* 3ft. Western Africa, 1853. This plant, in its habit of growth, resembles some of the largest species of *Salvia.* (B. M. 4717.)

BRISTLES. Stiff hairs.

BRISTLY. Covered with stiff hairs.

BRISTLY-TOOTHED. Furnished with teeth like bristles, or with the teeth ending each in a bristle.

BRIZA (from *briza*, to nod). Quaking Grass. ORD. *Gramineæ.* A genus of ornamental hardy Grasses. Panicle loose; calyx two-valved; corolla two-valved, awnless; exterior one ventricose, interior small and flat. Fruit adnate with the corolla. These extremely graceful plants delight in a soil composed of loam, leaf soil, and peat. Seeds may be sown in spring or autumn. For decorative purposes, the branches should be gathered as soon as full grown, and loosely placed in flower-stands, to dry. Tufts of these plants look extremely pretty on the rockery, or amongst hardy Ferns.

B. gracilis (graceful). A synonym of *B. minor.*

B. maxima (greatest).* *fl.*, spikelets oblong-cordate, thirteen to seventeen-flowered; panicle nodding at the end. June and July. *l.* long-linear, acuminate. *h.* 1½ft. South Europe, 1633. Annual. See Fig. 278.

Briza—*continued.*

FIG. 278. BRIZA MAXIMA, showing Habit and Single Flower.

B. media (middle).* Common Quaking Grass. *fl.*, spikelets broadly ovate, of about seven florets (calyx shorter than the florets), tremulous with the slight st breeze, very smooth, shining purple. Branches of the panicle thread-shaped, divaricating, purple. June. *l.* short, linear, acuminate. *h.* 1ft. Britain. Perennial. (S. E. B. 1774.)

B. minima (least). A synonym of *B. minor*.

FIG. 279. BRIZA MINOR, showing Habit and Small Panicle of Flowers.

B. minor (small).* Little Quaking Grass. *fl.*, spikelets triangular, seven-flowered; glumes longer than the flowers; panicle with hair-like branches. June and July. *l.* pale green, short, narrow. *h.* 8in. England (but very rare). An exceedingly pretty little annual grass. SYNS. *B. gracilis* and *B. minima*. See Fig. 279. (S. E. B. 1775.

B. spicata (spiked). A recent introduction from Brazil, described as being very graceful and quite distinct, having erect spikes about 8in. in height.

BROADCAST. A method of sowing seeds by means of the hand, scattering them over the surface of the ground as equally as possible. It is now superseded, for the majority of garden and field crops, by drilling, which not only economises the quantity of seed used, but greatly facilitates subsequent weeding and thinning out.

BROCCOLI (*Brassica oleracea botrytis asparagoides*). A cultivated variety of the Cabbage, having the young inflorescence condensed into a fleshy, edible head (see Fig. 280). To grow this popular vegetable successfully, it is necessary to have rich soil of a good depth, in an open situation, where the plants can have plenty of sun and air to keep them sturdy. They succeed the autumn Cauliflower, and are in season from November till May.

Soil. In preparing ground for Broccoli, trench, in the autumn, to the depth of from 1½ft. to 2ft., and during the process work in a liberal dressing of rotten farmyard manure. Ground which has carried a crop of Celery is very suitable for the strong-growing kinds, as, by planting where the Celery rows have been, the necessity of trenching is, to a great extent, obviated. Smaller kinds, however, need to be planted closer in order to obtain a profitable crop.

Cultivation. At the beginning of May, prepare seed beds on a south border, and sow the earlier and sprouting kinds. The later varieties would, perhaps, be best sown in April, but they must not be put in early and allowed to remain too long in the seed bed. Sow thinly, to get the plants as sturdy as possible; and, to prevent clubbing, work in a little

Broccoli—*continued.*

soot or wood ashes on the surface of the beds. Care must also be taken to pick off the club excrescences at planting time, should there be any, and to destroy the grub inside. Clubbing is not so frequent in ground which has been well trenched, and where the plants are not allowed to suffer from drought. Showery weather should be selected for transferring them to their permanent quarters. If it is desired that they should succeed potatoes, they may be planted between every two alternate rows, and the latter crop can be removed when ready. Broccoli succeed best where the ground is firm, and not recently dug or manured. Planting with a crowbar is preferable to digging the ground afresh. If grown by themselves, a distance of from 2ft. to 3ft. should be allowed between the rows, and an equal distance from plant to plant. Some of the early varieties will, in favourable seasons, follow the later Cauliflowers, while the latest will not be fit for use until the following spring. The heads should be cut as soon as they are large enough; they will keep good for a week in a cold place, while a day or two might open them too much if allowed to remain on the plants. Broccoli which have to stand the winter are liable to injury from severe frosts, and some method of protection is necessary. Two plans are

FIG. 280. BROCCOLI.

recommended for both large and small gardens, and either or both may be adopted, as found convenient. The first is to apply a covering of fern or other dry protective material, not using too much, but giving sufficient to break the rays of the sun, which, perhaps, do as much harm as the actual frost. The other plan is to take up the plants as soon as the flowers can be seen, and lay them in under a hedge or wall until required for use. In sheltered positions, or where there are trees to break the force of the wind, the covering with dry litter during severe weather will generally be found sufficient; still, a little precaution in lifting will frequently save a valuable crop. Broccoli should never follow a crop of any other kind of cruciferous plants, particularly Cabbage.

Sorts. Veitch's Self-protecting Autumn, Purple and White Cape, Grange's Early White, and Snow's Winter White. These are the best for autumn and mid-winter supplies. A good selection for spring and late purposes is Mitchinson's Penzance, Knight's Protecting, Cooling's Matchless,

Broccoli—*continued.*

Purple Sprouting, Model, Willcove, Leamington, and Cattell's Eclipse.

BRODIÆA (named after J. J. Brodie, a Scotch cryptogamist). SYN. *Hookera.* ORD. *Liliaceæ.* Pretty, slender, hardy, or in some positions only half-hardy, bulbs. The flowers are generally borne in large clusters or umbels; the scape is usually straight and slender, but strong. Leaves from two to four in number, enveloping the part of the scape beneath the surface, and procumbent thereon. Most of the species are of easy culture in rich sandy loam; if grown in pots, a mixture of loam, leaf soil, and sand, suits them well. Increased freely by offsets, which should be left undisturbed with the parent bulbs till they reach a flowering state, when they may be divided and replanted in autumn.

B. capitata (headed).* *fl.* deep violet-blue, funnel-shaped, disposed in a compact, many-flowered umbel; valves of the spathe also deep violet. May. *l.* narrow, linear. *h.* 1ft. to 2ft. California, 1871.

FIG. 281. BRODIÆA COCCINEA, showing Flower and Habit.

B. coccinea (scarlet).* *fl.* 1½in. long, tubular, rich blood-red below, the apex of the tube and the segments yellowish-green; umbels composed of five to fifteen drooping flowers. June. *l.* linear, loose, shorter than the scape. *h.* 1½ft. California, 1870. Very handsome, distinct from all other species, requiring a warm, well-drained, and sunny position, and to remain undisturbed. SYN. *Brevoortia coccinea.* See Fig. 281. (B. M. 5857.)

B. congesta (close-headed).* *fl.* blue, with the crown paler; segments cleft at the top; umbel bearing six to eight blossoms. The stamens in this species are metamorphosed into fleshy scales, which adhere to the mouth of the perianth. Summer. *l.* few, long, slender, channelled on the inside. Bulb small, roundish, and much wrinkled. *h.* 1ft. Georgia, &c., 1806. A very free-growing and rapidly increasing species.

B. c. alba (white).* *fl.* white; in other respects like the type, but not so vigorous.

B. gracilis (graceful).* *fl.* deep yellow, with brown nerves, ½in. or rather more long, in few-flowered umbels. July. *l.* solitary, about ½in. broad, longer than the scape. *h.* 3in. to 4in. California, 1876. A scarce and rather tender little species, but very pretty.

B. grandiflora (large-flowered).* *fl.* bluish-purple, with entire pointed segments; umbels bearing two to seven somewhat scattered blooms. Summer. *l.* two to three or more, linear, pointed, slender, grooved on the inside, furnished with a few membranous scales. Bulb small, roundish, dry and wrinkled. *h.* 1½ft. North America, 1806. SYN. *Hookera coronaria.* (B. R. 1183.)

B. Howellii (Howell's).* *fl.* purplish-blue, about ¾in. across, sub-bell-shaped, in many-flowered umbels. July and August. *l.* narrow acute, grooved, shorter than the scape. *h.* 18in. to 24in. California, 1880.

Brodiæa—*continued.*

B. ixioides (Ixia-like). *See* **Calliprora lutea.**

B. lactea (milky-white).* *fl.* white, usually with green midribs, ½in. to ¾in. across, saucer-shaped, in many-flowered umbels. June and July. *l.* linear, acute, nearly as long as the scape. *h.* 1ft. to 2ft. California, 1833. SYNS. *Hesperoscordon lacteum, Milla hyacinthina.*

B. multiflora (many-flowered).* *fl.* blue-purple, very numerous, in sub-globose heads. May. *l.* linear, elongate, 1ft. to 2ft. long, rather fleshy. *h.* 1ft. to 1½ft. California, 1872. (B. M. 5989.)

B. volubilis (twining). *fl.* rose-coloured, in dense umbels, each containing fifteen to thirty blossoms; scape twining, sometimes 12ft. long. July. *l.* narrow, linear-lanceolate, 1ft. long, synanthous. California, 1874. Half-hardy bulb. (B. M. 6123.)

BROMELIA (named after Bromel, a Swedish botanist). ORD. *Bromeliaceæ.* A genus of stove herbaceous perennials, allied to the Pineapple. Flowers, corolla three-petaled, convolute, erect, or spreading at the top. Leaves densely packed, rigid, lanceolate, with spiny margins. Stems short These plants require much the same treatment as *Billbergia.* Allied genera are *Æchmea, Ananas, Billbergia, Disteganthus, Greigia, Karatas* (which *see*).

B. antiacantha (opposite-spined). *fl.* purple, scarlet. Brazil, 1864. SYN. *B. sceptrum.*

B. bicolor (two-coloured).* *fl.* scarlet, in a close central sessile head. March. *l.* numerous, narrow, ensiform, outer green, central crimson; elegantly radiate. Chili, 1872. SYN. *B. Joinvillei, B. pitcairniæfolia.* (B. H. 14.)

B. bracteata (red-bracted).* *fl.* pink; scape elongated; raceme compound; bracts red, ovate-lanceolate. September. *l.* serrate, spiny. *h.* 2ft. Jamaica, 1785.

B. Fernandæ (Fernanda's).* *fl.* yellowish, in ovoid heads; bracts orange-red. July. *l.* linear-ligulate, 24in. to 30in. long, recurved, spiny-edged. Para, 1872.

B. Joinvillei (Joinville's). A synonym of *B. bicolor.*

B. Karatas. *See* **Karatas Plumieri.**

B. pitcairniæfolia (Pitcairnia-leaved). A synonym of *B. bicolor.*

B. sceptrum (sceptre-like). A synonym of *B. antiacantha* and *Karatas Plumieri.*

BROMELIACEÆ. An extensive order of stemless or short-stemmed plants, having rigid, channelled, and usually spiny leaves. Flowers very showy; outer perianth three-cleft, persistent, inner one of three withering segments; stamens six, inserted in the tube of the perianth. To this order belongs the Pineapple. The genera best known in gardens are *Æchmea, Ananas, Billbergia, Bromelia,* and *Tillandsia.*

BROMHEADIA (in honour of Sir Edward Finch Bromhead). ORD. *Orchideæ.* A small genus of stove Orchids, comprising a couple of species, with erect stems, large flowers, and cucullate lip, which is parallel with the column. For culture, *see* **Ansellia.**

B. palustris (marsh).* *fl.*, sepals and calyx white; lip white externally, within streaked with purple, and having a yellow blotch in centre; spike terminal, distichous, flexuous, many-flowered, on a long peduncle; bracts short, stiff, tooth-like. June. *l.* distichous, oblong-linear, emarginate. *h.* 2ft. Singapore, 1840. (B. R. 30, 18.)

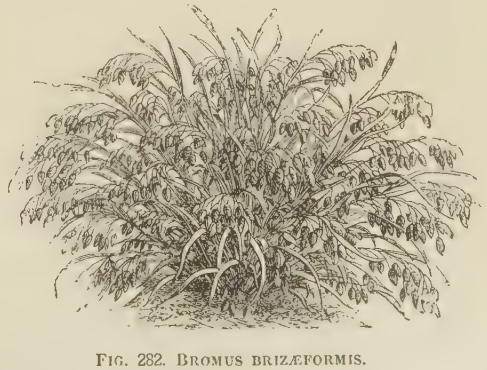


FIG. 282. BROMUS BRIZÆFORMIS.

BROMUS (from *Bromos,* the Greek name for a wild oat). ORD. *Gramineæ. B. brizæformis* (see Fig. 282) is an elegant biennial Grass, with drooping panicles of spikelets,

Bromus—*continued.*

about as large as those of *Briza maxima*. It grows about 2ft. high, and is of very easy culture in common garden soil. Sow seeds outside in patches, in July, thinning out the plants when necessary. There are numerous other species belonging to this genus, but the above-mentioned is the only one worth growing in gardens. It forms a beautiful object in the mixed border, or among ferns.

BRONGNIARTIA (in honour of Adolphe Brongniart, a distinguished botanist, and one of the editors of "Annales des Sciences Naturelles"). ORD. *Leguminosæ*. Handsome greenhouse evergreen sub-shrubs, clothed with silky villi. Flowers large, purple; pedicels twin, axillary, one-flowered. Leaves impari-pinnate, with many pairs of leaflets, the terminal one not remote from the rest. They require a compost of sandy loam, leaf soil, and fibry peat, with perfect drainage. Cuttings of the young shoots, if firm at the base, will root if dibbled in sand, under a bell glass, in a cool house.

B. podalyrioides (Podalyria-like).* *fl.* purple, large. September. *l.* with two to five pairs of leaflets; leaflets elliptic-oblong, rounded, and mucronate at the apex, clothed with adpressed hairs on both surfaces, but silky when young. *h.* 1ft. New Spain, 1827.

B. sericea (silky).* *fl.* purple. September. *h.* 1ft. *l.*, leaflets ovate-oblong, acute, very silky on both surfaces. Mexico, 1843.

BROOK-LIME. *See* **Veronica Beccabunga.**

BROOM. *See* **Besom.**

BROOM. *See* **Cytisus scoparius.**

BROOM RAPE. *See* **Orobanche.**

BROOM, SPANISH. *See* **Spartium junceum.**

BROSIMUM (from *brosimos*, edible; fruit edible). Bread Nut. ORD. *Urticaceæ*. A genus of stove evergreen shrubs or trees, principally of economic value in their native countries. Male and female flowers generally in a globular head, but sometimes borne on separate trees; calyx and corolla wanting. Leaves entire. They generally thrive in a rich fibry loam. Cuttings of ripe wood, with their leaves on, root if placed in sand, in moist heat.

B. Alicastrum. *fl.*, catkins globose, stalked, twin, axillary. *fr.* coated. *l.* ovate-lanceolate. *h.* 6ft. Jamaica, 1776.

BROUGHTONIA (named after Mr. Arthur Broughton, an English botanist). ORD. *Orchideæ*. A very compact-growing stove evergreen, allied to *Lælia*, succeeding best if suspended from the roof on a block of wood, with a little moss; it requires a free supply of heat and water when in a growing state. Propagated by dividing the plant. The colour of the flowers is very distinct.

B. sanguinea (blood-coloured).* *fl.* blood-coloured, rather large, disposed in a terminal panicle; scape divided; column distinct, or at the very base united with the unguiculate lip, which is lengthened at the base into a tube, connate with the ovarium. Summer. *l.* twin, oblong, seated on a pseudo-bulb. *h.* 1½ft. Jamaica, 1793. (B. M. 3076.)

BROUSSONETIA (named after P. N. V. Broussonet, a French naturalist, who wrote numerous works on Natural History). ORD. *Urticaceæ*. Ornamental fast-growing, deciduous, Mulberry-like trees. They require rather good open garden soil, and prove hardy in situations which are not very exposed. Propagated by suckers and cuttings of ripened wood, inserted in autumn, in a cool house; and by seeds, sown when ripe, or kept till the following April.

B. papyrifera (paper-bearing).* The Paper Mulberry. *fl.* greenish, dioecious; males in pendulous, cylindrical catkins, each flower in the axil of a bract; females in peduncled, axillary, upright globular heads. May. *l.* simple, alternate, exstipulate, variously lobed or entire, hairy, large. *h.* 10ft. to 20ft. China, 1751. There are several varieties, differing in the shape and character of the leaves. (B. M. 2358).

BROWALLIA (named in honour of John Browall, Bishop of Abo, who defended the sexual system of Linnæus against Siegesbeck, in a book entitled "Examen epicriseos," &c., 1739). ORD. *Scrophularineæ*. A genus of handsome shrubs or herbs. Flowers blue or white, axillary and terminal; corolla salver-shaped, resupinate from the contortion of the peduncle; tube fifteen-nerved, ventricose at top. Leaves alternate, stalked, ovate in outline. They thrive best in a rich, open, sandy soil. To have strong plants in flower by Christmas and after, seeds should be sown in July, in pans or pots of light rich sandy soil, and kept in a close frame, or hand light, where they can be shaded till germination takes place. When large enough to handle, the seedlings may either be pricked out, three in a pot, or potted singly, according to the size of the specimens required. In the former way, they form fine masses for conservatory or greenhouse decoration, or to cut from; and in the latter, they are very suitable for window recesses, &c. After potting, they should be stood in a pit or frame, and syringed every morning and evening, to ward off attacks of insect pests. An abundance of well-diluted liquid manure is required as soon as the flower-buds appear. To keep the plants dwarf and bushy, it will be needful to stop them about three times during the remainder of the summer and autumn, keeping as near the glass as possible; they should be housed by the end of September. These elegant little greenhouse annuals are unrivalled for affording choice, neat sprays for bouquets during the winter and early spring months, or for growing as pot plants, to furnish warm greenhouses or sitting-room windows. Many of the species and varieties are largely employed for summer decoration of the flower garden, with highly satisfactory results; for this purpose, seeds should be sown in gentle heat early in spring, and the plants transferred to the flower borders late in June, or early in July, having been previously encouraged in pots, and well hardened off.

Browallia—*continued.*

B. abbreviata (shortened). *fl.* light red; pedicels shorter than the calyx; calyx campanulate, with teeth as long as the tube. *l.* oval, hairy when young, quite glabrous when mature. 1852. (R. G. 94.)

B. demissa (low).* *fl.* of a bright but pale blue colour, sometimes red or purple; peduncles axillary, one-flowered, downy. June. *l.* ovate-oblong, acuminated, oblique at the base. *h.* 6in. to 1ft. Panama, 1735. (B. M. 1136.)

FIG. 283. BROWALLIA ELATA, showing Habit and Flower.

B. elata (tall).* *fl.* deep blue; calyx beset with glandular hairs; peduncles axillary, one or many-flowered. July. *l.* oval, acuminated. *h.* 1½ft. Peru, 1768. Of this extensively-grown species there are two varieties, one with white flowers, and the other, *grandiflora*, with pale blue, both of which are well worth growing. See Fig. 283. (B. M. 34.)

B. grandiflora (large-flowered).* *fl.*, corolla with a greenish-yellow tube, which is clothed with glandular villi, and a white or very pale lilac limb; peduncles one-flowered, axillary, racemose at the tops of the branches. July. *l.* ovate, acute, attenuated into the petioles at the base. *h.* 1ft. to 3ft. Peru, 1829. (B. M. 3069.)

B. Jamesoni (Jameson's). A synonym of *Streptosolen Jamesonii*.

B. Roezli (Roezl's). *fl.* large, either of a delicate azure-blue, or white, with a yellow tube. Spring to autumn. *l.* shining green. An exceedingly pretty species, having flowers double the size of any other, and forming a dense compact bush, 1½ft. to 2ft. in height. Rocky Mountains.

BROWNEA (named after Patrick Browne, M.D., author of a History of Jamaica). ORD. *Leguminosæ*. Very handsome stove evergreen trees or shrubs, allied to *Amherstia*. Flowers of a rose-scarlet colour, rising in fascicled heads from the axillary buds. Leaves abruptly-pinnate, when young flaccid, and with the leaflets revolute at the edges; leaf-bud long and stipulaceous. All the species are well worthy of the most extensive cultivation. A mixture of loam, peat, and sand, is a soil well adapted for them, and great care should be taken not to over-water the plants in winter, as too great a supply will be sure to kill them. Propagated by cuttings, taken from ripened wood, planted in a pot of sand, and placed under a hand glass, in a moist heat.

B. Ariza (Ariza).* *fl.* richest scarlet, produced in a large, globular, drooping head of immense size. Summer. *l.* pinnate, usually with six or eight pairs of pinnæ, which are oblong-lanceolate, and sharply tapered to a point. *h.* 20ft. to 40ft. Columbia, 1843. This noble tree requires a large house to fully perfect its beauty. SYN. *B. princeps*. (B. M. 6459.)

B. Birschellii (Birschell's). *fl.* rose-coloured, in drooping racemes. April to July. *l.* pinnate; leaflets oblanceolate, 6in. long. *h.* 10ft. to 20ft. La Guayra, 1872. (B. M. 5998.)

B. coccinea (scarlet).* *fl.* scarlet, fascicled. July and August. *l.* with two to three pairs of oval-oblong, acuminated leaflets. *h.* 6ft. to 10ft. Venezuela, 1793. (B. M. 3964.)

B. grandiceps (large-headed).* *fl.* red, in dense capitate spikes. July. *l.* with usually twelve pairs of oblong-lanceolate glandless leaflets, ending in a long cuspidate acumen; branches and petioles pubescent. *h.* (in its native home) 60ft. Caraccas, 1829. (B. M. 4859.)

B. latifolia (broad-leaved). *fl.* red, in dense fascicles; involucre tomentose. *l.* with one to three pairs of ovate or obovate-cuspidate leaflets. *h.* 6ft. to 8ft. Caraccas, 1824.

B. macrophylla (large-leaved).* *fl.* orange-scarlet, in dense heads, often measuring nearly 3ft. in circumference. Central America, 1879. (G. C. 1873, p. 779.)

B. princeps (chief). A synonym of *B. Ariza*.

B. racemosa (clustered).* *fl.* rose-coloured, racemose; involucre and calyx clothed with fine tomentum. *l.* with four pairs of unequal-sided, oblong, or oblong-lanceolate, cuspidately-acuminated leaflets, which are glanduliferous at the base. *h.* 4ft. Caraccas, 1826.

B. Rosa del Monte. *fl.* scarlet, in dense heads; leaflets of the involucre roundish, imbricated, and, when in a young state, rather velvety. June. *l.* with two to three pairs of oval-oblong acuminated leaflets; branches and petioles glabrous. *h.* 8ft. South America, 1820. (B. R. 1472.)

BROWNLOWIA (named in honour of Lady Brownlow, daughter of Sir Abraham Hume, and a great patroness of botany). ORD. *Tiliaceæ*. Very handsome greenhouse evergreen trees, thriving well in a mixture of loam and peat. Cuttings of ripe shoots will root if placed in sand, under a hand glass, in heat.

B. elata (tall).* *fl.* yellow; panicle terminal, conical, spreading. May. *l.* large, cordate, acute, seven-nerved, smooth. *h.* 60ft. India, 1823. (B. R. 1472.)

BRUCEA (commemorative of James Bruce, the celebrated African traveller). ORD. *Simarubeæ*. Ornamental stove evergreen shrubs. Flowers small, purplish inside, disposed in interrupted glomerate spikes, or racemes. Leaves impari-pinnate, with six pairs of opposite, entire or serrated leaflets, without dots. Branches, peduncles, petioles, and nerves of leaves, clothed with rufescent down. They thrive in a loamy soil; and cuttings from ripened wood strike freely, in a pot of sand, under a hand glass, in a moderate heat.

B. antidysenterica (antidysenteric). *fl.*, racemes simple, spike-like. May. *l.*, leaflets quite entire, clothed with rusty villi on the nerves beneath. *h.* 8ft. Abyssinia, 1775.

B. sumatrana (Sumatra).* *fl.* dark purple; racemes usually compound. May. *l.*, leaflets serrated, villous beneath. *h.* 20ft. Sumatra, 1822.

BRUCHUS GRANARIUS. *See* **Bean Beetle.**

BRUCHUS PISI. *See* **Pea** (INSECTS).

BRUGMANSIA. *See* **Datura.**

BRUNFELSIA (named after Otto Brunfels, of Mentz, first a Carthusian monk, and afterwards a physician; he published the first good figures of plants in 1530). SYN. *Franciscea*. ORD. *Scrophularineæ*. Elegant free-flowering

Brunfelsia—*continued.*

stove evergreens. Flowers sweet-scented; corolla large, funnel or salver-shaped, with a long tube, and a flat, five-lobed, obtuse, nearly equal limb. A light rich soil, or a compost of loam, leaf soil, and peat, is necessary to grow these plants successfully. Propagated by cuttings, planted in sand, and placed under bell glasses, in a moderate heat. When rooted, they should be placed in small pots, in a compost somewhat more sandy than that already mentioned. While growing, they require to be kept in a moist stove temperature, and should be hardened by placing them in a drier, and somewhat cooler, temperature after each growth is completed; the pots should be changed as often as the roots become thick around the ball of earth. The larger plants flower freely, and should be slightly pruned in annually, before commencing their new growth, thus securing neat and compact specimens. Repotting should be effected directly they have done flowering. The plants should then be placed in a temperature ranging from 60deg. to 68deg., and both the roots and foliage liberally supplied with water. When flowers appear—about October or November—the syringing must be less frequently performed. At this period, if it be desirable to prolong the flowering season, the plants should be removed to a temperature of about 48deg. A few administrations of weak liquid manure during the growing season are of great value.

B. acuminata (taper-pointed-leaved).* *fl.* bluish-violet, few, sub-cymose, terminal. April. *l.* oblong, acuminated, attenuated a little at the base, glabrous; bracts lanceolate, acuminated, glabrous. *h.* 1ft. to 2ft. Rio Janeiro, 1840. (B. M. 4189.)

B. americana (American).* *fl.* first yellow, then white, very sweet-scented; axillary flowers solitary, terminal ones numerous. June. *l.* obovate, elliptic, acuminated, longer than the petioles. *h.* 4ft. to 6ft. West Indies, 1735. There are narrow and broad-leaved varieties of this species. (B. M. 393.)

FIG. 284. FLOWER OF BRUNIA NODIFLORA.

B. calycina (cup-shaped).* *fl.* purple, disposed in large trusses, which are produced in succession throughout the whole year. *l.* large, lanceolate, shining light green. *h.* 2ft. Brazil, 1850. One of the largest-flowered species grown. (B. M. 4583.)

B. confertiflora (dense-flowered). *fl.* soft blue, cymosely crowded, terminal. January to June. *l.* nearly sessile, oblong-acute, attenuated at the base, rather pilose, ciliated, yellowish-green

Brunfelsia—*continued.*

above; bracteoles oblong, attenuated at the base, and are, as well as the calyces, clothed with rusty hairs. *h.* 1ft. to 2ft. Brazil.

B. eximia (choice).* *fl.* produced from the points of the shoots, upwards of 2in. in diameter, deep purple. January to July. *l.* oblong-lanceolate, dark green, but not glossy. *h.* 2½ft. Brazil, 1847. (B. M. 4790.)

B. grandiflora (large-flowered). *fl.* greenish; limb of corolla 2in. in diameter, corymbose, terminal. June. *l.* elliptic-oblong, acuminated. Branches twiggy. *h.* 3ft. Peru.

B. hydrangeæformis (Hydrangea-like).* *fl.* beautiful bluish-violet; cymes terminal, hemispherical, large. April. *l.* oblong, acute, cuneiform at base, quite glabrous, 1ft. long; bracts lanceolate, aggregate. *h.* 1ft. to 3ft. Brazil, 1840. This is one of the most elegant species of the genus. (B. M. 4209.)

B. latifolia (broad-leaved). *fl.* at first lavender-colour, with a distinct white eye, eventually becoming almost white; deliciously fragrant, sub-cymose, terminal. Winter to early spring. *l.* broad-elliptic, acutish, greyish-white, 6in. to 7in. long, and 2in. to 2½in. broad. *h.* 2ft. to 3ft. Brazil, 1840. (B. M. 3907.)

B. Lindeniana (Linden's).* *fl.* rich purple, with a light eye. *l.* ovate-acuminate, dark green. Brazil, 1865. (B. H. 1865, 226.)

B. uniflora (one-flowered). *fl.* solitary; corolla with a whitish tube, and a bluish-violet or purple limb. Winter. *l.* elliptic, acute; branches greenish, hoary, diffuse, spreading. *h.* 1ft. to 3ft. Brazil, 1826. (L. B. C. 1332.)

BRUNIA (named after Corneille de Bruin, better known under the name of Le Brun, a Dutchman, a traveller in the Levant). ORD. *Bruniaceæ*. Elegant little greenhouse evergreen Heath-like shrubs, more or less branched, with the branches in whorls, erect or spreading. Flowers capitate, furnished with three bracts each, or sometimes deficient of the two lateral ones. Leaves small, closely imbricate. They require a compost of peat and sand, with a little leaf soil added, firm potting and good drainage. Cuttings of young shoots root freely in sand, under a hand light, in summer.

B. nodiflora (knot-flowered).* *fl.* white; heads globose, size of a cherry, on the tops of the branches. July. *l.* lanceolate, awl-shaped, trigonal, acute, smooth, closely imbricate, not ustulate at the apex. *h.* 1ft. to 3ft. Cape of Good Hope, 1786. See Fig. 284.

BRUNIACEÆ. An order of much-branched Heath-like shrubs, usually having small leaves, which are crowded and entire. Flowers in terminal heads; petals five, alternating with the lobes of the calyx. The typical genus is *Brunia*.

BRUNONIA (named after Robert Brown, the most eminent botanist of his time). ORD. *Goodenoviæ*. A stemless greenhouse perennial herb, with the habit of *Scabiosa*, downy from glandless simple hairs. Flowers distinct, with a whorl of five membranous bracts; corolla blue, marcescent. Radical leaves quite entire, spathulate; scapes undivided, each bearing one head; head hemispherical, lobate; lobes involucrated by foliaceous bracts. It thrives in a compost of decayed manure, or leaf soil and peat, with a little loam added; thorough drainage is necessary. Propagated by divisions, in early spring, previous to repotting.

B. australis (southern)* is the only species known to be in cultivation. *h.* 1ft. New Holland, 1834. (B. R. 1833.)

BRUNSVIGIA (named after the noble House of Brunswick). ORD. *Amaryllideæ*. Very showy greenhouse bulbous plants, from the Cape of Good Hope. Flowers red, on very long pedicels. Bulbs large. Leaves broad, horizontal; perianth with an evident longer or shorter tube, curving upwards, funnel-shaped, deeply six-parted, deciduous; segments sub-equal, many-nerved, flat, and recurved at the apex; stamens on the tube much curved upwards; scape appearing in summer without the leaves; umbels many-flowered. Propagation is effected by offsets, of which the large bulbs produce but few. These, when secured, may be removed after reaching some considerable size, carefully potted in a mixture of sandy loam and peat, with good drainage, and kept tolerably warm and close until established; water must be given but sparingly until root-action has commenced. The best place for growing the offsets into a flowering size is on a shelf near the glass, in a temperature of from 50deg. to 55deg. With an abundance of water while growing, and kept dry while semi-dormant, thus allowing them a rest, the bulbs

Brunsvigia—*continued.*

will speedily increase in size; but it may be years before flowers are produced. Culture: This may be divided into two periods—one of growth, and one of rest. After the latter period, they should be allowed to start into fresh growth, without stimulation, and, as soon as started, liberal supplies of water should be given, and a genial temperature of from 60deg. to 65deg. maintained, to make them grow vigorously. Good-sized pots are also necessary, with a mixture of loam, peat, and sand, in equal parts. They are usually confined to the greenhouse, or warm conservatory, but are sometimes successfully grown in a south border at the base of a wall, planted out in a pit, upon which the lights may be placed in winter, and matted if necessary, as they cannot endure frost. A good depth of soil, consisting of fibrous loam, peat, and sand, in equal proportions, with good drainage, should be prepared. In all cases, the bulbs should be planted somewhat deeply. One of the most satisfactory methods of ensuring the flowering of these plants consists in subjecting the bulbs, when at rest, to a hot dry heat of 70deg. or more, which thoroughly ripens them; but, after this treatment, it will be necessary to encourage the after-growth to the fullest possible extent.

B. ciliaris (hair-fringed). *fl.* dull purple. *l.* strongly fringed with white hairs. *h.* 1ft. 1752. (B. R. 1153.)

B. Cooperi (Cooper's).* *fl.* sulphur-coloured, edged with red; umbels twelve to sixteen-flowered. *l.* ligulate-obtuse, bifarious, fleshy. *h.* 1½ft. 1872. (Ref. B. 330.)

B. falcata (sickle-leaved).* *fl.* red. May. *l.* sickle-shaped, with a muricated, discoloured, cartilaginous edge. *h.* 9in. 1774. (B. M. 1443.) SYN. *Ammocharis falcata*.

B. Josephineæ (Josephine's).* *fl.* scarlet; scape twice as long as the rays of the many-flowered umbel. *l.* strap-shaped, erect, spreading, glaucous. *h.* 1½ft. This handsome species is much grown. 1814. (B. M. 2578.) *minor* and *striata* are varieties.

B. multiflora (many-flowered).* *fl.* red, loosely umbellate. June. *l.* linguiform, smooth, lying on the ground. *h.* 1ft. 1752. (B. M. 1619.)

B. toxicaria (poison-bulb).* *fl.* pink; umbel hemispherical, many-flowered. September to October. *l.* many, erect, oblique, glaucous. *h.* 1ft. 1774. (B. R. 567.) *B. coranica* is a variety of this. 1815. (B. R. 139.)

BRUSSELS SPROUTS (*Brassica oleracea bullata gemmifera*). A cultivated variety of the Cabbage (Fig. 285). Leaves blistered. Stems covered with small, close

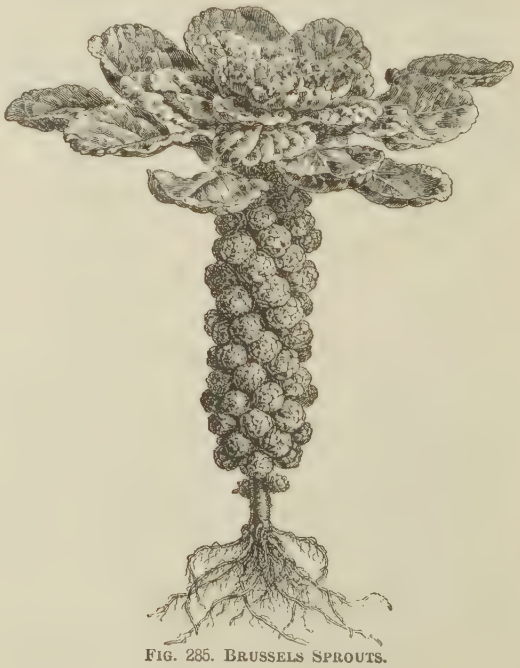


FIG. 285. BRUSSELS SPROUTS.

Brussels Sprouts—*continued.*

heads. To secure this vegetable in its best form, it must be grown on deeply-worked and rich ground. In addition, the seeds should be obtained from a good source, as there are many spurious stocks in cultivation. Plenty of room must be allowed the plants to develop, and the tops and leaves should not be removed till after the sprouts are gathered; dead leaves, of course, excepted. It is a bad plan to plant Brussels Sprouts amongst potatoes or other crops, as they become unduly weakened, and never give such good returns as when grown by themselves.

Soil and Cultivation. In February, and early in March, sow thinly in a cold frame, or carefully prepare seed beds on a warm south border. As soon as the plants are large enough, prick them off into prepared soil, to grow on; about the end of April, transplant into a piece of rich ground, which has been previously prepared for them, setting in rows from 2ft. to 3ft. asunder, and 2ft. apart in the rows. The earlier the plants are put out, the better; and they should be watered-in when planted, so that they receive as little a check as possible. They must be kept clear of weeds, and earthed up as soon as they get a good size. During severe frost, some light dry litter may with

Brussels Sprouts—*continued.*

FIG. 286. BRYONIA LACINIOSA.

Brussels Sprouts—*continued.*

advantage be thrown over them for protection; and the less they are interfered with when frozen, the better.

Sorts. The Imported is the best strain for general use; other good sorts are: Sutton's Matchless, The Aigburth, and Scrymger's Giant.

BRYA (from *bryo*, to sprout; the seeds germinate before falling from the tree). ORD. *Leguminosæ.* A small genus of stove shrubs or small trees, furnished with stipular spines, and solitary, or clustered, or pinnate leaves. The undermentioned species thrives in a rich fibry loam. Propagated by seeds, or by cuttings, placed in a hotbed.

B. Ebenus (ebony). Jamaica Ebony. *fl.* bright yellow; peduncles two to three together, axillary, one to two-flowered, shorter than the leaves. July and August. *l.*, leaflets aggregate, obovate. *h.* 12ft. to 14ft. West Indies, 1713. (B. M. 4670.)

BRYANTHUS (from *bryon*, a moss, and *anthos*, a flower). ORD. *Ericaceæ.* A genus of small trailing shrubs, allied to *Loiseleuria.* Flowers terminal, somewhat racemose; calyx five-leaved, imbricate; corolla deeply five-parted, spreading. Leaves crowded, spreading, flattish. For culture, *see* **Menziesia.**

B. empetriformis (Crowberry-leaved). *fl.* reddish-purple, clustered near the extremities of the branches. *l.* crowded, linear, on short adpressed petioles. *h.* 6in. North-west America, 1829. SYN. *Menziesia empetrifolia.* (B. M. 3176.)

B. erectus (erect). *fl.* red, pentamerous, broadly campanulate. *l.* linear, obtuse, obscurely serrated. *h.* about 1ft. Siberia. Trailer. (L. & P. F. G. 1, 19.)

B. Gmelini (Gmelin's). *fl.* red; peduncles glandular, many-flowered. *l.* with denticulated margins. *h.* 2in. or 3in. Kamtschatka and Behring's Island.

BRYONIA (from *bryo*, to sprout; in allusion to the annual growth from the tuber). Bryony. ORD. *Cucurbitaceæ.* Tuberous-rooted perennial herbaceous plants, producing annual climbing stems. The native species is well worth growing over unsightly hedges, fences, &c., and in the wild garden; it is a rapid grower, and of extremely easy culture. The stove perennial species should be grown in pots, and the stems trained up the rafters. Rich loam is the soil most suitable for their cultivation. Propagated by seeds, or by divisions of the tuber.

B. dioica (diœcious). *fl.* greenish-white, racemose, diœcious. *fr.* globose, red. May to September. *l.* cordate, palmately five-lobed, toothed, scabrous, from callous points. England. (Sy. En. B. 517.)

B. laciniosa (cut-leaved). *fl.* yellow, solitary; corollas hairy inside, smooth outside. *fr.* size of a cherry, striated with white. July. *l.* palmately five-parted, cordate, rough, and blistered, with oblong-lanceolate, acuminated, serrated segments; petioles muricated. Ceylon, 1710. Stove species. SYN. *Bryonopsis laciniosa.* See Fig. 286.

BRYONY. *See* **Bryonia.**

BRYOPHYLLUM (from *bryo*, to sprout, and *phyllon*, a leaf; plants spring from the notches on the edges of the leaves when taken off the plant, and placed in a moist situation). ORD. *Crassulaceæ.* This very curious stove succulent thrives in pots of rich loamy soil; perfect drainage is essential, and but little water is at any time needed.

B. calycinum (large-cupped). *fl.* yellowish-red; cymes panicled, terminal. April. *l.* opposite, thick, petiolate; some impari-pinnate, with one or two pairs of segments, the terminal one large; others solitary; all ovate and crenated. *h.* 2ft. to 3ft. India, 1806. A fleshy, erect, branched evergreen shrub, grown chiefly for curiosity.

BUCCO. *See* **Agathosma.**

BUCIDA. *See* **Terminalia.**

BUCKBEAN. *See* **Menyanthes.**

BUCKLANDIA (named after Dr. Buckland, a former Dean of Westminster, and Professor of Geology at Oxford). ORD. *Hamamelideæ.* A handsome greenhouse tree, allied to *Liquidambar.* It thrives in rich sandy loam, peat, and leaf mould; or peat may be left out if the leaf soil is good; perfect drainage is also essential. Cuttings of ripened shoots will strike in sandy loam, under a hand glass, with

Bucklandia—*continued.*

moderate heat. They must be watered carefully, or they are liable to rot off.

B. populnea (Poplar-like). *l.* pale green, large, leathery, cordate, ovate-acute, on long stalks, pinkish when young; stipules very curious, large red, consisting of two leafy oblong plates, placed face to face in an erect position between the leafstalk and the stem. *h.* 100ft. Himalayas, 1875. (B. M. 6507.)

BUCKLER MUSTARD. *See* **Biscutella.**

BUCKTHORN. *See* **Rhamnus.**

BUCKWHEAT. *See* **Fagopyrum esculentum.**

BUCKWHEAT-TREE. *See* **Mylocaryum.**

BUDDING. This process consists of taking an eye or bud attached to a portion of the bark, and transferring it to another and different plant; it is an operation almost confined to woody plants, but has been practised with more or less success upon herbaceous perennials. The stock should not be budded unless the sap is in circulation, which is assured if the bark will detach itself easily, when gently lifted, from the wood.

There are many ways of performing the different systems, in preparing and inserting the Buds, &c., and all may prove more or less successful if undertaken when the Buds and stock are both in a suitable condition. The principal methods are Shield or T-budding, including the Circular, Square, and Inverted forms; Flute or Tube-budding, and Annular or Ring-budding.

The first-named method, which is fully described below, is very extensively practised for propagating Roses and stone fruits. It is also coming more in use for the propagation of many other fruit trees, including Apples and Pears, especially new or scarce varieties, as the great advantage of making use of many more of the eyes, to form separate trees, is thereby attained. In large nurseries, where skilful propagators are employed, thousands of trees are annually budded, the majority of them with very successful results. It is, in most cases, preferable to purchase established fruit trees, as cultivators require the produce much quicker than they could get it by propagating trees themselves. The same system of Budding is, however, applicable for increasing Roses; and this may be adopted with every chance of success by even a cottager, if he takes the necessary care in performing the work.

Rare varieties of ornamental deciduous trees are largely propagated in this way; for instance, many of the Acers, Elms, Horse Chestnuts, &c. Evergreen shrubs, such as Rhododendrons and Hollies, are also rapidly increased in some establishments by this means.

In the case of fruit-trees, plump wood Buds must be selected, from medium-sized branches. On some sorts these are scarce, the majority being Flower-buds, and it is rather difficult to distinguish between them at the Budding season. The best time for the operation is from June to the end of August; but surrounding influences, condition of Buds, stocks, &c., must be taken into account. Clean cuts, with gentle and skilful handling, are even more important in the Budding of stone fruits than of Roses or other plants, and the ties should be lightly but firmly made. In all cases, the operation must be performed as quickly as possible, as both Bud and bark are injured if exposed to the air for any length of time.

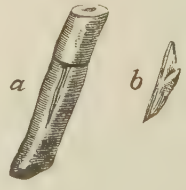


FIG. 287.

FIG. 288.

To proceed with the ordinary system of Shield-budding, the stock (see Fig. 287 *a*) should first have a longitudinal and

Budding—*continued.*

a transverse incision made in the bark, the former about 1in. long. Next, the Bud should be prepared, removing half the leaf (see Fig. 288). Hold the branch with the left hand, and pass the knife from about ½in. below, gradually upwards and inwards under the Bud, bringing it out in a similar way at a somewhat shorter distance above. A portion of wood will also be taken out, and this is generally removed the opposite way to that in which the Bud has been cut. By skilful Budders, it is removed by a sort of twitch from either end. Great care must be taken not to pull out the base or root of the Bud at the same time, as this would render it useless. Should the whole come out together, leaving a hollow place under the eye of the Bud, it must be thrown away, and another prepared. The Bud being ready, loosen the bark at the point where the incisions meet, with the ivory knife handle, and insert it by means of the piece of leaf attached. It must then be tied in with soft matting or bast, to exclude air, but not tight enough to injure the bark. Shading from bright sun is advisable for a few days afterwards, and, as soon as the union takes place, the ties must be frequently examined, and loosened if necessary. Some prefer Budding late in the season, in order that the Bud may remain dormant during the winter, and breaking stronger the following spring. Occasionally, Buds are inserted in spring, just at the commencement of growth. The stocks of the Summer-budded trees should only be allowed a moderate amount of foliage during the autumn, and should be cut back to the established Bud before growth commences in spring.

Square and Circular Shield-budding consists in cutting out a piece of bark of either shape from the stock, and inserting another piece of exactly the same size, containing a Bud, and covering with a bandage, or piece of sticking plaster, all except the eye. This mode is seldom made use of. Inverted T or Shield-budding is preferred in the south of France for propagating Orange-trees, but is not otherwise much used. The only difference is that the transverse incision is made below, instead of above, the other, and the Bud inserted upwards, making it fit with the bark at the point where the stock is cut across.

Flute-budding is sometimes used, and answers well for some trees (see Fig. 289). A cylinder of bark is removed

FIG. 289.

from the stock, and one of a similar size from the scion, containing Buds, is fitted in its place, being carefully made air-tight by means of a bandage or grafting wax. Some prefer splitting the bark, as shown in the illustration, and laying it over the tube or cylinder; but the parts cannot be fitted so well as when it is removed.

Ring Budding. By this mode, it is not necessary to cut off the top of the stock. A ring of bark may be removed from any convenient part (see Fig. 290 *b*) and replaced with one containing eyes (see Fig. 290 *a*). The latter should be taken from a little larger branch than the stock, as the bark could then be made to fit better. As in Flute-budding, air must be excluded by means of adhesive paper and bandages or grafting wax.

Budding operations may be performed at any time during the season; but dull cloudy weather, and morning or evening, are most suitable. If the branch, containing

Budding—*continued.*

Buds, cannot be obtained as required for use, the ends may be placed in water, to keep them fresh; but unnecessary delay should be avoided.

Stocks for Budding upon. For the Cherry, the Wild Gean, and seedlings from the Morello, make capital stocks for tall trees and those of moderate growth; and the Mahaleb, or Perfumed Cherry, for small trees for pots, bushes, pyramids, or cordons. For the Plum, the Mussel, Myrobalan, Magnum Bonum, St. Julian, &c., are mostly used for stocks, the Myrobalan being best for small trees. Peaches and Nectarines are generally budded on the Mussel, St. Julian, or Myrobalan Plums; the last are best for dwarfs. The Apricot is budded on the Mussel or

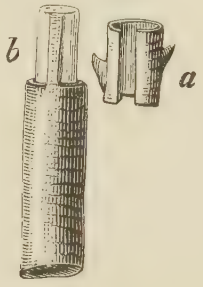


FIG. 290.

Myrobalan Plums, for small plants; and the St. Julian Plum for standards. In France, the Damas Noir, or Black Damask, and the Cerisette, are also used. They should all be raised from seeds, and not from suckers. Seeds for raising plants for stocks may be sown as soon as ripe; but where quantities are used, the stones are thrown into heaps, so as to slightly ferment during winter. In the

FIG. 291.

spring, they are sown in drills or beds, and transplanted the next year in rows 2ft. or 3ft. apart, and 10in. or 12in. from plant to plant. The dwarfs are generally budded the second year, and the standards the third or fourth. Dwarf trees are budded from within a few inches of the

Budding—*continued.*

ground to 1ft. above; standards and riders from 3ft. to 9ft.; cordons, pyramids, &c., can hardly be budded too low.

Rose Budding. Propagation of Roses by Budding is very extensively practised both with standard trees and dwarf plants. It is perhaps easier and more certain to succeed with these than with fruit trees; but the mode adopted is precisely the same—that of the shield-shaped Bud with the core, or root, and the bark attached. For standards, the common briar of the Dog Rose is the best. The earlier these are obtained and planted in November, the better, as roots are then formed at once. For dwarf plants, the Manetti stock is mostly used, being easily obtained and had in proper condition almost at any time when Buds are ready. Plants on this stock do not succeed in all soils, and suckers are also very liable to be produced. Budding on the seedling briar is attended with good results, and is practised more than hitherto. The De la Grifferaie stock is also used, more for Tea Roses than others, and is considered by some to produce better plants than the Manetti. The shoots on standard briars should be reduced to about three of the strongest, selected as close together as possible, and near the top, the briars having been previously cut back the desired height at planting time. Two Buds are sufficient for a good head; but, for certainty, three may be inserted. Fig. 291 represents a tall briar with three shoots; *a* shows the shoot slit for the Bud; *b*, the Bud inserted; *c*, the Bud tied in. Fig. 292 is a branch showing Buds, the lowest ones of which are most suitable, being in firmer wood. Those at the top are often useless. Fig. 293 represents a Bud taken from Fig. 292, *a*, *b*, and Fig. 294 gives an idea of how the wood is removed. As previously remarked when describing the system, experienced Budders remove the wood from either end. Fig. 294 shows its removal from the lower end.

FIG. 292.

FIG. 293.

FIG. 294.

Budding as close as possible to the main stem is most desirable. Raffia grass is superior in every way for tying, which should be performed as soon after the Bud is inserted

FIG. 295.

as possible. It requires much care, and, of course, the Bud itself must be entirely free. As soon as the Buds

Budding—*continued.*

swell, the tying material should be loosened, and the top of the stock cut back to the level of the budded shoot. By Budding late, the Buds lie dormant till the next spring, and the necessity of tying the young shoots is dispensed with for that season. The shoots of the briar in advance of the Rose Buds must be cut back, as shown in Fig. 295, so soon as the Buds are safely established. The Manetti and other dwarf stocks are budded on the main shoot nearly close to, or underneath the ground, and if low enough to cover part of the rose stem when grown, the latter often roots as well and assists the stock. Being small, they may be grown in pots and removed to the required position at any time.

Dog Roses, used for standards, are usually collected from hedgerows, and sold at about 8s. per hundred. Manetti stocks are increased by cuttings, which, after making one season's good growth, will be fit for use. Briars are raised from seed, which may be collected from hedges, and sown in the autumn, in drills. The seedlings should be transplanted the first year after sowing, and the following season they will be ready for working.

BUDDING KNIVES. The best Budding Knives are those manufactured by Messrs. Saynor and Co., and Messrs. G. Hall and Son. They are made with handles of ivory, shaped in different ways at the end, for the purpose of opening the bark, in order to insert the Bud. Some of the blades are made with the edge rounded at the point, so as to cut the bark without the knife entering the wood underneath (see Figs. 296 and 297). Others, which may be

FIG. 296.

FIG. 297.

FIG. 298.

FIG. 299.

FIG. 300.
BUDDING KNIVES.

used for Budding, and are much better for ordinary use for cutting flowers, &c., are made with the edge of the blade carried to a point, as in ordinary knives (see Figs. 298 and 299). Another form has the handle made of some other material, and a piece of ivory inserted for opening the bark; this is represented in Fig. 300. The first-named is the best, if required for Budding only; the second is the most useful for ordinary purposes, and answers admirably for Budding as well. None of the other shapes have any material advantages over these.

BUDDLEIA (named after Adam Buddle, who is so often mentioned in Ray's "Synopsis"; his collection of dried British plants is preserved in the British Museum). ORD. *Loganiaceæ*. A large genus of stove, greenhouse, or half-hardy shrubs. Flowers small, often tomentose, axillary, spicate, capitate, or thyrsoid; calyx equally four-toothed; corolla tubular-campanulate, regular; limb spreading, four-toothed. Leaves opposite, reticulately veined. Branches quadrangular.

Buddleia—*continued.*

The species most extensively grown is *B. globosa*, which, among all our other shrubs, is quite unique; but it is only in the southern or favoured counties of England where it can be fairly termed hardy. It is readily propagated by cuttings or by seeds. The latter should be sown in a gentle heat the spring following the ripening, when they will vegetate pretty freely. With careful treatment and nurturing in pots for the first winter, in a frost-proof pit or house, they may soon be grown into elegant plants. Cuttings of the ripened wood, put in under bell glasses or hand lights, in a cool but frost-proof pit, will root slowly during the winter. They will root all the surer and quicker if each cutting has a heel of older wood attached to that of the current year's growth. They are best inserted in fine sand or in very sandy soil, and require but little water until rooted. As soon as fairly calloused over or rooted, their further progress may be much advanced by potting them off, and plunging them in a bottom-heat of 60deg. or 65deg. This is by no means an essential to secure success, but it hastens it, and promotes growth in an extraordinary manner. The surface temperature should range about the same as the bottom-heat. Under such treatment, the plants will be quite fit to place out about the middle of July. A warm, sheltered situation should be chosen, and a light, rich soil prepared for them; and if dry weather ensues, they only require water. South or west walls are, without doubt, the best situations for them. In all cool or unfavourable localities, much may be done to ensure success by planting on a dry bottom, and on poorish soil. A loose, free-and-easy style of training suits the plants best. This enables them to yield a great number of their peculiarly formed, distinct, and beautiful flowers; whereas, anything like a close, trim course of pruning or of training reduces the flowers to the lowest number.

Throughout the southern parts of England, and, indeed, in many places in the north, *B. globosa* makes an excellent bush for the shrubbery. It is only during severe winters that it gets badly cut.

For the other presumably hardy species much the same plan as the foregoing may be adopted. The greenhouse and stove kinds may have the same routine of culture usually employed with plants requiring similar temperatures.

Stove species, except where specified otherwise.

B. americana (American). *fl.* yellow; spikes disposed in a terminal panicle, nearly 1ft. long; glomerules nearly globose, size of a sloe, on short peduncles. August. *l.* ovate, acuminated, narrowed at the base, serrately crenated. *h.* 8ft. to 12ft. Peru, 1826.

B. asiatica (Asiatic).* *fl.* white, small, disposed in long, dense racemes. *l.* lanceolate, finely serrated. *h.* 3ft. India, 1874. A graceful and sweet-scented shrub. SYN. *B. Neemda.* (B. M. 6323.)

B. crispa (curled). *fl.* lilac, with a white eye; numerously produced in long terminal branching spikes, forming a pyramidal head about 6in. long. March. *l.* ovate-lanceolate, crenately curled; lower ones cordate at the base; superior ones rounded, all thick and wrinkled, clothed with soft tomentum on both surfaces. *h.* 13ft. Western Himalayas. Half-hardy. (B. M. 4793.)

B. globosa (globose).* *fl.* orange, or honey-colour; heads large, terminal, globose, pedunculate. May. *l.* lanceolate, acuminated, petiolate, crenated, 6in. long. Branches sub-tetragonal, clothed with hoary tomentum, as well as the under side of the leaves. *h.* 15ft. to 20ft. Chili, 1774. Hardy in most places. (B. M. 174.)

B. Lindleyana (Lindley's). *fl.* purplish-red, hairy; disposed in terminal racemose spikes. September. *l.* ovate, shortly petiolate, serrate. Branches angular, glabrous. *h.* 6ft. China, 1844. Half-hardy. (B. R. 32, 4.)

B. Neemda (Neemda). A synonym of *B. asiatica.*

BUDS, FLOWER. These are developed like Leaf-buds, from which they differ chiefly in containing one or more incipient flowers within the leaves—the flowers being wrapped up in their own floral-leaves, within the ordinary leaves, which have their outer covering of scales. If a Bud be gathered from a Lilac or Horse-chestnut very early in spring, all the rudiments of the future flowers and leaves will be found within it, though the Bud itself may not be more than half-an-inch long, and the flowers not larger than the points of the smallest pins.

BUDS, LEAF. These consist of rudimentary leaves, surrounding a growing vital point, and appear like a collection of scales arranged symmetrically one above the other. Leaf-buds universally originate in the horizontal or cellular system, and are formed under the bark at the extremity of the medullary rays, and at the margin or on the surface of leaves, whether perfect or rudimentary. Deciduous trees lose their leaves, but in the axil of each a little Bud previously forms, from which fresh leaves expand the following spring. In some cases, as in the Horse-chestnut, the Buds are covered with a gummy exudation. In Privet-trees, Leaf-buds are generally smaller and more elongated than Flower-buds.

BUETTNERIA (named after David Sigismund Augustus Byttner, once a Professor of Botany in the University of Gottingen). ORD. *Sterculiaceæ.* Erect or scandent stove or greenhouse shrubs. Flowers small, usually dark purple; calyx and corolla valvate; umbels simple, disposed in something like racemes or panicles, rarely in corymbs. Leaves simple. All are of easy culture in a compost of loam and peat. *B. dasyphylla, hermanniæfolia, microphylla,* and *scabra,* are occasionally met with, but they are hardly worth growing.

BUETTNERIEÆ. A section of *Sterculiaceæ.*

BUFF-TIP MOTH (*Pygæra bucephala*). This large and beautiful Moth is very common in many districts; it is easily recognised by the buff-coloured tips of the fore-wings—whence its common name; the head, and body between the wings and abdomen, are ochreous. According to Newman's "British Moths," "the caterpillars, when full grown, are about an inch and three-quarters long, and sprinkled with silky hairs; the general colour yellow, with black head, black lines running from the head to the tail, interrupted by a transverse orange band on each ring, and a black horny plate above the tail segment." They feed on the leaves of the Lime, Elm, and Oak, among other trees, and apparently the only remedy is that generally adopted in exterminating caterpillars, viz., to shake the branches which are infested, when the pest will be quickly dislodged, and fall to the ground. Miss Ormerod is of opinion that "as the caterpillars come down the tree to the ground for their change to chrysalids, it might be worth while to throw a few spadefuls of gas-lime, or of anything they would not cross, in a circle at about a yard from the tree; or a rough band of any material soaked in tar, or tar and oil, which would keep wet longer, would stop them from straying off . . . and they might be cleared in sufficient numbers so as to considerably lessen future attack." This plan of prevention deserves a trial in any place where the destructive caterpillars of these Moths abound. It is almost a hopeless task to destroy them altogether when once established on the trees, such specimens as large Oaks being often almost or wholly denuded of foliage.

BUGLE. *See* **Ajuga.**

BUGLOSSUM BARRELIERI. *See* **Anchusa Barrelieri.**

BUGWORT. *See* **Cimicifuga.**

BULBIFEROUS. Bearing bulbs.

BULBINE (from *bolbos,* a bulb). ORD. *Liliaceæ.* A genus of rather pretty hardy, or nearly hardy, herbaceous or bulbous plants, allied to *Anthericum.* Flowers showy, fragrant; perianth with spreading segments. Leaves somewhat fleshy, narrow. Stems short. They are all of easy culture in a compost of sandy loam. The bulbous-rooted species are increased by offsets, and the herbaceous sorts by suckers and divisions. The only species which can be grown satisfactorily in the open air is *B. annua.* All the others should be grown in the greenhouse, but may be placed in the open during the summer months.

Bulbine—*continued.*

B. alooides (Aloe-like).* *fl.* yellow, disposed in a terminal panicle. April. *l.* fleshy, tongue-shaped, lanceolate, flat on both sides. *h.* 1ft. Cape of Good Hope, 1732. SYN. *Anthericum alooides.* (B. M. 1317.)

B. annua (annual). *fl.* yellow; scape racemose. May, June. *l.* fleshy, subulate, rounded. *h.* 9in. Cape of Good Hope, 1731. An annual species, the seeds of which should be sown in a gentle heat during spring, and the seedlings may be transplanted to the open when large enough to handle. SYN. *Anthericum annuum.* (B. M. 1451.)

B. caulescens (caulescent).* *fl.* yellow. March. *l.* fleshy, rounded. Stem shrubby, erect, branched. *h.* 2ft. Cape of Good Hope, 1702. A shrubby species, which should be propagated by cuttings, placed under a hand glass. SYN. *B. frutescens.* (B. M. 816.)

B. frutescens (shrubby). Synonymous with *B. caulescens.*

BULBOCODIUM (from *bolbos*, a bulb, and *kodion*, wool; referring to the woolly covering of the bulbs). ORD. *Liliaceæ.* TRIBE *Colchiceæ.* A very pretty little bulbous plant, much resembling the *Crocus*, from which it differs principally in having a superior ovary and six stamens. It is amongst the earliest of spring-flowering plants, the flowers preceding the foliage; and, like the majority of bulbs, delights in rich sandy loam. In such positions, they multiply rapidly from offsets. It is a good plan to take up the bulbs, divide, and replant them every second year, selecting in autumn, and renewing the soil or planting in new positions. Few plants prove more welcome in the garden, in February, than *B. vernum*, either in beds, patches, or masses.

B. Aitchisoni (Aitchison's). A synonym of *Merendera persica.*

B. Eichleri (Eichler's). A synonym of *Merendera caucasica.*

B. trigynum. A synonym of *Merendera caucasica.*

FIG. 501. BULBOCODIUM VERNUM.

B. vernum (spring).* *fl.* violet-purple, with a white spot on the claw; long, tubular, funnel-shaped, two to three from each bulb; preceding the appearance of the leaves. Very early spring. *l.* usually three in number, broadly strap-shaped, concave, and surrounded at the base by well-developed sheaths. Bulb black, oblong. *h.* 4in. to 6in. Spain, 1649. See Fig. 501. There is a is a variety with the leaves striped white, which is also desirable.

BULBOPHYLLUM (from *bulbos*, a bulb, and *phyllon*, a leaf; referring to the leaves issuing from the apex of the pseudo-bulbs). SYNS. *Anisopetalum, Bolbophyllum, Tribrachium.* ORD. *Orchideæ.* Of this rather large genus of orchids but few are worth cultivating except as curiosities. Racemes long or spike-like, very rarely one-flowered or sub-umbellate; sepals usually nearly equal and free; lip jointed to the foot of the column. They are of easy culture when grown on small blocks of wood with a little moss, and suspended in a warm part of the house; the roots require a good supply of water. Propagated by dividing the pseudo-bulbs.

Bulbophyllum—*continued.*

The following comparative few of the aggregate number of species already introduced are really all that are worth the cultivator's attention; what the botanist often regards as being very pretty, &c., does not always appear such in the eyes of the grower.

B. barbigerum (bearded).* *fl.*, sepals and petals greenish-brown; lip covered with dark-coloured hair, and so loosely attached at the base as to be moved with the slightest breath. Sierra Leone, 1835. A curious dwarf-growing plant, with dark green leaves and pseudo-bulbs. (B. R. 1942.)

B. Beccarii (Beccari's). *fl.* light brownish and painted with violet; lip brown, with a violet hue, proceeding from a rhizome at the base of the leaf (just below the small pseudo-bulb), and at once turning downwards; racemes dense, cylindrical, nodding. *l.* three, 25in. long, 18in. across, very thick. Rhizome 20in. long. Brazil, 1879. A remarkable and gigantic climbing species; the odour of this plant is intolerably fœtid, and the leaves are larger than those of any other known orchid. This species requires plenty of heat. (B. M. 6517.)

B. Lobbi (Lobb's).* *fl.* large; sepals and petals yellow, the upper part spotted with purple; solitary, on radical scapes. Summer. Java, 1845. (B. M. 4532.)

B. maculatum (spotted). *fl.* prettily spotted, *l.* long, obtuse, bright green. India.

B. reticulatum (netted-leaved).* *fl.* in pairs, white, striped inside with purple; lip spotted with the same colour. *l.* somewhat heart-shaped, with the nerves of a deeper green than the rest of the leaf, giving it a beautifully reticulated appearance. Brazil, 1866. Perhaps the handsomest of the genus. (B. M. 5605.)

B. saltatorum (dancing). *fl.* greenish-brown, lasting some time in perfection. Winter. *h.* 6in. Sierra Leone, 1835. (B. R. 1970.)

B. siamense (Siamese).* *fl.* pale yellow, striped with purple; lip yellow, streaked with purplish lines. A very pretty species, closely allied to *B. Lobbi*, but with longer and stouter leaves. Pseudo-bulbs ovate. Siam, 1867. Should be grown in a pot of peat and sphagnum.

BULBOSTYLES (from *bolbos*, a bulb, and *stylos*, the style). ORD. *Compositæ.* A small genus of stove evergreen plants, now referred to *Eupatorium.*

BULBS. A Bulb is formed upon or beneath the ground, and is a swollen stock, consisting, in the first place, of a more or less fleshy disk, which below gives rise to the roots; secondly, of more or less fleshy coats, or scales, borne on the disk; thirdly, of a more or less central shoot, equally borne by the disk, protected by the coats or scales already mentioned, and formed of rudimentary leaves and flowers. In some instances, small Bulbs, called Cloves, are formed at the base of the scales of the original Bulb; these are destined to reproduce the plant. Shallot and Garlic are good examples. Bulbs are, in fact, storehouses, husbanding the strength and energy acquired by the plant during one season, for the exigencies of the next. They are classified under two sections—Scaly and Tunicated. In the former, the scales of the Bulb are imbricated, as in the Lily; in the latter, they form continuous coatings, one within the other, as in the Hyacinth, &c. In several Lilies, young Bulbs are found growing in the axils of the leaves, when they are known as Bulbils. Bulbs is also a popular term given to Dutch Flower Roots, mostly arriving here in the autumn for spring flowering. Crocus, Colchicum, Cyclamen, Gladiolus, and several others, are not Bulbs, but Corms. The flowering season varies according to the different sorts of Bulbs. The majority may be lifted and kept tolerably dry during the resting period; but they wither and become exhausted if not replanted at the proper time, thereby causing many failures. Dutch Bulbs generally arrive in September, and the best results are obtained from those potted or planted at once, although some for succession may be kept in reserve up till the beginning of November. The failure in cultivating imported Liliums and other Bulbs may be often caused by their long-continued confinement in a dry atmosphere, whereby their vitality is often almost lost. The roots of some Bulbs are nearly always, more or less, in action, and these, especially, should not be kept out of the ground for any length of time.

BULLACE. *See* **Prunus insititia.**

BULLACE, or **MUSCADINE.** *See* **Vitis vulpina.**

BULLATE. Blistered or puckered.

BULRUSH, or **CLUB-RUSH.** *See* **Typha.**

BUNCHOSIA (from *bunchos*, the Arabic name for Coffee; in allusion to the similarity between the seeds of this genus and those of Coffee). ORD. *Malpighiaceæ*. Ornamental greenhouse evergreen shrubs, nearly allied to *Malpighia*, but having the racemes of flowers axillary. Fruit fleshy, indehiscent, externally smooth, and containing two or three seeds. They thrive best in a compost of loam, peat, leaf soil, and sand, in about equal proportions.

Bunchosia—*continued.*

B. odorata (fragrant).* *fl.* yellow, sweet-scented; racemes opposite. May. *l.* ovate, emarginate, downy on both surfaces. *h.* 7ft. Carthagena, 1806.

BUPHTHALMUM (from *bous*, an ox, and *ophthalmos*, the eye; the disk of the flower being ox-eye-like). Oxeye. ORD. *Compositæ*. Very showy and ornamental hardy perennial plants, thriving freely in common garden soil. They are propagated by divisions, made in autumn or spring.

B. grandiflorum (large-flowered).* *fl.-heads* yellow, large; involucre naked. June to October. *l.* alternate-lanceolate, somewhat toothleted, smooth. *h.* 1½ft. Austria, 1722. Hardy herbaceous perennial.

B. salicifolium (Willow-leaved).* *fl.-heads* yellow, solitary, rather

FIG. 302. BURBIDGEA NITIDA.

Cuttings of ripened shoots will root in sand under a bell glass, in moist bottom heat, taking several weeks to do so. Good drainage is essential, both in striking cuttings and in the cultivation of the plants.

B. argentea (silvery).* *fl.* yellow; racemes opposite, simple, pubescent. July. *l.* lanceolate, silvery beneath. Branches puberulous. *h.* 10ft. Caracas, 1810.

B. glandulifera (gland-bearing). *fl.* yellow; racemes simple, axillary. March to May. *l.* elliptical-ovate, on short petioles, wavy, pubescent on both surfaces, furnished with four glands beneath at the base. *h.* 10ft. Caracas, 1806.

B. nitida (shining). *fl.* yellow; racemes elongated, almost the length of the leaves. July. *fr.* large, red; it is much eaten by turkeys and other large fowl. *l.* 4in. long, oblong, acuminated, smooth, glandless. *h.* 4ft. Jamaica, 1800.

large, terminal; involucre naked. June. *l.* alternate, oblong-lanceolate, sub-serrated, three-nerved, villous. *h.* 1½ft. Austria, 1759.

B. speciosissimum (showiest).* *fl.-heads* yellow. July. *h.* 2ft. South Europe, 1826. SYN. *Telekia speciosissima.*

BUPLEURUM (derivation not satisfactorily explained). Hare's-Ear. ORD. *Umbelliferæ*. A somewhat extensive genus of quite glabrous shrubs or herbaceous plants. Flowers yellowish; umbels compound. Leaves mostly quite entire. But few of this genus are worth growing, and all are of the easiest culture in common garden soil. Propagation is effected, in the case of annuals, by seed, sown in the open border in March or April; in the case of perennials by division, in either spring or autumn; and in

Bupleurum—*continued.*

that of shrubby species, by cuttings or divisions, in March or April.

B. fruticescens (shrubby).* *fl.*, umbels small, three to five-rayed; involucre of three to five, very short, subulate leaves. August. *l.* linear-subulate, stiff, striated, five to seven-nerved. Branches slender, elongated, erect. *h.* 1ft. Spain, 1752. Hardy and evergreen.

B. fruticosum (shrubby).* Leaves of involucre oblong. July. *l.* of a sea-green colour; oblong, attenuated at the base, coriaceous, one-nerved, quite entire, sessile. Bark of branches purplish. *h.* 3ft. to 6ft. Spain, 1596. Hardy. This is nearly the only species grown. (W. D. B. 1, 14.)

B. gibraltarica (Gibraltar). *fl.* yellow. June. *l.* lanceolate, one-nerved, coriaceous. *h.* 3ft. Gibraltar, 1784. Evergreen, half-hardy.

B. graminifolium (grass-leaved).* *fl.* green-yellow. June. *l.* linear, grass-like. *h.* 6in. Switzerland, 1768. Hardy perennial.

B. longifolium (long-leaved). *fl.* green-yellow. June. *l.* ovate-oblong; radical ones stalked; cauline ones amplexicaul. *h.* 3ft. Switzerland, 1713. Hardy perennial.

BUR. *See* **Centotheca lappacea.**

BURBIDGEA (named after F. W. Burbidge, the discoverer of the genus, a traveller in Borneo, and author of several horticultural works). ORD. *Scitamineæ*. A very large, brilliant-flowered stove herbaceous perennial, allied to *Hedychium*. For culture, *see* **Alpinia.**

B. nitida (shining).* *fl.*, perianth-tube 1in. to 1½in. long, slender; outer segments 1½in. to 2in. in diameter, bright orange-scarlet; panicle terminal, 4in. to 6in. long, many-flowered. Summer. *l.* 4in. to 6in. long, elliptic-lanceolate, cordate-acuminate, rather fleshy, bright green above. Stems tufted, 2ft. to 4ft. high, slender, terete, leafy. N. W. Borneo, 1879. See Fig. 302, for which we are indebted to Messrs. Veitch and Sons. (B. M. 6403.)

BURCHARDIA (named after H. Burchard, M.D., a botanical author). ORD. *Liliaceæ*. An ornamental greenhouse herbaceous perennial, allied to *Androcymbium*. It thrives best in sandy peat, or peat mixed with a little loam. Propagated by offsets or divisions, made just previous to potting, in spring. It is best to repot annually. Good drainage should be allowed, and the plant must not be potted too firmly.

B. umbellata (umbelled). *fl.* white, green. August. *h.* 2ft. New Holland, 1820.

BURCHELLIA (named after W. Burchell, a botanical traveller in the Cape of Good Hope, and in Brazil). ORD. *Rubiaceæ*. A stove evergreen shrub from the Cape of Good Hope. Flowers scarlet, disposed in heads at the tops of the branches, sessile upon a villous receptacle, intermixed with small distinct bracteoles; and each head is propped up by the ultimate pair of leaves; corolla of a clavate-funnel-shape. Leaves ovate, acute, a little cordate at the base, petiolate; stipules interpetiolar, broad, cuspidate at the apex, deciduous. It grows well in a rich light soil, or a mixture of turfy loam, turfy peat, and sand. Cuttings, not too ripe, root readily if planted in sand, and placed under a hand glass, in a gentle heat.

B. bubalina (buffalo). A synonym of *B. capensis*.

B. capensis (Cape).* *fl.* deep scarlet, nearly 1in. long. March. *l.* ovate, acute, clothed with hispid pubescence; stipules very broad, and very short. *h.* 3ft. to 5ft.; 12ft. to 14ft. in a wild state. SYN. *B. bubalina*. (B. M. 2339.)

BURLINGTONIA (named after the "amiable and accomplished" Countess of Burlington). ORD. *Orchideæ*. A small genus of epiphytal Orchids, all of which are beautiful and eminently well worth growing. They may be grown upon small blocks of wood, or in rustic baskets, suspended from the roof of the plant stove, where, if liberally treated with water, and a genial moisture in the air during the growing season, very little else will be

Burlingtonia—*continued.*

required to ensure health and vigour. In the dull days of winter, they should be watered less frequently, but the plants must not be allowed to exhibit the slightest signs of distress from drought, or the consequences may be fatal to their health. When fastening these plants to blocks of wood, a little sphagnum should be used, for experience proves that they thrive best when their thin white roots can escape and hang exposed to the air. If growing them in baskets, it is preferable first to fasten them securely upon small pieces of bare cork, then to fill the basket, and finally to cover the whole thinly with a layer of sphagnum.

Generally speaking, this genus is not a difficult one to cultivate; its great enemy is a small white scale, which

FIG. 303. FLOWER-SPIKE, PSEUDO-BULB, AND LEAF OF BURLINGTONIA DECORA

secretes itself in the sheathing bases of the leaves. Here it rapidly multiplies, to the great detriment of the plants; the leaves soon turn yellow at the base, and drop off; the whole plant looks sickly, and soon dies, or else requires a very long time and much trouble to achieve its recovery to health. To prevent this, the bases of the leaves must be carefully looked into every time the plants are taken down to be dipped in water; and, should the slightest sign of this pest appear, a thorough washing with soft soap and tepid water must be given, repeating the operation every day until all traces of the insect are removed. Red thrips are also apt to work much mischief

Burlingtonia—*continued.*

with these plants. They take up their abode in the same way as the white scale, and if not speedily removed or destroyed, soon make sad havoc. To put a stop to the ravages of this pest, a wash should be given, as before recommended, and after the soap has been rinsed out of the base of the leaf, a little tobacco powder should be sprinkled into the hollows, and allowed to remain for a day or two before brushing it off. This process will, however, cause a somewhat dirty appearance, but it will ensure ultimate health and vigour. Propagated by dividing the plants.

B. Batemanni (Bateman's).* *fl.* white, deliciously-scented; lip beautiful mauve. A very pretty South American species, resembling *B. candida.*

B. candida (white).* *fl.* snowy-white, with a slight stain of yellow on the upper part of the lip, in substance and appearance like white satin, trimmed with gold; large, sweet-scented, in gracefully drooping three to four-blossomed racemes, produced from the axils of the leaves. April and May, lasting about three weeks in perfection, and sometimes having a second flowering season. *l.* one or two in number, dark green, and firm in texture. *h.* 1ft. Demerara, 1834. A very compact species, well suited for basket culture; it should never be allowed to get dry. It may be distinguished from other species by having a single row of tubercles, forming a ridge upon each side of the slightly hastate lip. (B. R. 1927.)

B. decora (comely).* *fl.* white or rose-coloured, spotted with red; lip pure white; scapes erect, five to ten-flowered. Winter. Brazil, 1852. This species differs entirely from *B. candida*, inasmuch as it possesses a long slender-rooting stem, from different parts of which arise small oval pseudo-bulbs, each bearing a leaf; a lesser leaf appears at the base of a bulb, and from the axil of this the scape springs. It is a rather straggling but nevertheless beautiful species, and is best grown fastened upon long strips of cork, a little sphagnum being used in the operation; whilst, to prevent the plant getting too much "away from home," the young growths should be twisted back as they advance, and the practice continued until the pseudo-bulb is ultimately left near the centre, or in any spot which may appear bare. It likes strong heat and a very moist atmosphere, when growing; but during the period of rest, it should be kept cool and dry. See Fig. 303. (B. M. 4834.)

B. d. picta (painted).* A beautiful variety, differing from the type in having shorter and more acute leaves; flowers produced in greater profusion, rose-coloured, beautifully mottled and blotched with dark purple. October. Brazil. (B. M. 5419.)

B. fragrans (fragrant).* *fl.* very gratefully fragrant, disposed in erect racemes. April, remaining in perfection about three weeks. *l.* long, rigid, dark green. Habit compact. Brazil, 1850.

B. pubescens (downy). *fl.*, sepals and petals snow-white; distinguished by the somewhat hastate lip, which has three yellow ridges on each side, and also by the downy column. November. *h.* 6in. Brazil, 1850.

B. rigida (rigid).* *fl.* purplish-white, spotted with pink on the lip; produced in heads. *h.* 1ft. Brazil, 1838. A handsome plant, but difficult to flower. (L. S. O. 36.)

B. venusta (charming).* *fl.* white, slightly tinted with pink; produced in heavy pendulous clusters at various seasons of the year; lip stained with yellow. *l.* rigid, dark green. Brazil, 1840. It forms a compact mass, and requires less heat than the kinds previously described. It is often confounded with *B. pubescens*, from which it may be distinguished by its larger and more loosely arranged flowers, by its smooth column, by the lip not being hastate in shape, and by the numerous shallow ridges borne near the base upon each side. (L. S. O. 2.)

BUR MARIGOLD. *See* **Bidens.**

BURNET (*Poterium Sanguisorba*; from *poterion*, a cup; being used in cooling drinks). ORD. *Rosaceæ.* A native perennial. The leaves are sometimes used in salads, and with Borage in cooling drinks; they are also put in salads. The foliage only being useful, keep the flower-spikes removed, as this tends to increase the luxuriance of the plants. It thrives in any light soil. Propagated by division.

BURNET SAXIFRAGE. *See* **Pimpinella**

BURNING BUSH. *See* **Euonymus atropurpureus** and **E. americanus.**

BUR ONION. *See* **Potato Onion.**

BUR REED. *See* **Sparganium.**

BURSARIA (from *bursa*, a pouch; the capsules very much resemble those of the Shepherd's Purse). ORD. *Pittosporeæ.* A handsome, much-branched, greenhouse evergreen shrub, forming a very pretty object when covered all over with its elegant white blossoms. It thrives well in a compost of sandy loam and peat, in equal proportions. Young cuttings will root freely in sand, under a bell glass, with a little bottom heat.

Bursaria—*continued.*

B. spinosa (thorny).* *fl.* white, small, disposed either in lateral or terminal panicles. July to December. *l.* small, oblong-cuneated, entire. *h.* 10ft. New Holland, 1793. (B. M. 1767.)

BURSERA (named after Joachim Burser, a disciple of Caspar Bauhin). ORD. *Burseraceæ.* Stove balsam-bearing trees. Flowers polygamous, or hermaphrodite; calyx small, four to six-toothed; petals four to six, spreading, generally valvate in æstivation; stamens eight to twelve; disk annular, with usually six to ten teeth; drupe oblong, covered by a three-valved succulent rind, containing three to five nuts. They thrive in a compost of loam and peat. Propagated by cuttings, placed under a glass, with bottom heat.

B. gummifera (gum-bearing). *fl.* whitish, hexandrous; racemes terminal and axillary. *l.* deciduous, usually impari-pinnate; leaflets ovate, acute, membranous. *h.* 60ft. West Indies, 1690.

B. serrata (serrate).* *fl.* whitish, decandrous; panicles axillary, shorter than the leaves. *l.* impari-pinnate, with three to five pairs of broad-lanceolate, bluntly-acuminated, serrulated leaflets; petioles and pedicels pubescent. *h.* 25ft. India, 1818.

BURSERACEÆ. An order of shrubs or trees, abounding in resinous juice; with opposite compound leaves, full of pellucid dots, and axillary and terminal fascicles of flowers. Fruit indehiscent, somewhat drupaceous. The genera best known are *Amyris*, *Balsamodendron*, *Boswellia*, *Bursera*, and *Canarium.*

BURTONIA (named after D. Burton, a plant collector for Kew Gardens). ORD. *Leguminosæ.* A genus of handsome greenhouse dwarf Heath-like shrubs, natives of West Australia. Flowers axillary, often thickly gathered at the ends of the branches; corollas rich purple; keel generally of a deeper colour, and the standard having sometimes a yellow blotch at its base. Leaves simple or trifoliolate, sessile, usually awl-shaped. They thrive well in a mixture of loam, peat, leaf soil, and sand, in equal proportions, with thorough drainage; but care must be taken not to give them too much water, as they require to be kept moderately dry, and are difficult to preserve in a living state. Young cuttings root freely in a pot of sandy soil, in a cool house, with a bell glass placed over them; but some of the species produce seed in abundance, which are the best means of increasing them.

B. conferta (cluster-flowered).* *fl.* violet. July. *l.* simple, very much crowded, six to eight lines long, linear-subulate, with revolute margins, and are, as well as the branches, smooth. *h.* 2ft. 1830. (B. R. 1600.)

B. minor (smaller). A synonym of *Gompholobium minus.*

B. pulchella (beautiful). A synonym of *B. scabra.*

B. scabra (rough).* *fl.* purple; peduncles axillary, bi-bracteate. April. *l.*, leaflets glabrous, linear-mucronate. Branches puberulous. *h.* 2ft. 1846. SYN. *B. pulchella.* (B. M. 5000.)

B. villosa (villose). *fl.* purple, large; peduncles axillary, bi-bracteate. May. *l.* leaflets linear-subulate, bluntish, scabrid. *h.* 2ft. 1846. (B. M. 4410.)

BUSHEL. *See* **Measures.**

BUTCHER'S BROOM. *See* **Ruscus aculeatus.**

BUTEA (commemorative of John, Earl of Bute, once a munificent patron of botany). ORD. *Leguminosæ.* A genus of very ornamental stove evergreen unarmed trees. Racemes many-flowered; flowers three together, on short pedicels, and furnished with two bracteoles each, under the calyx; corolla deep scarlet; down on the calyces usually black and velvety. Leaves pinnately-trifoliolate; leaflets large, ovate, roundish, stipellate. For culture, &c., *see* **Erythrina.**

B. frondosa (leafy). *fl.* 2in. long. *l.*, leaflets roundish, obtuse, or emarginate, rather velvety beneath. Branches pubescent. *h.* 40ft. India, 1796. (B. F. S. 176.)

B. superba (superb).* *l.*, leaflets roundish, obtuse, velvety

Butea—*continued.*

beneath. Branches glabrous. Coromandel, 1798. This approaches the preceding species, from which it differs mainly by its scandent habit, and not by any botanical characters. (B. F. F. 143.)

BUTOMACEÆ. An order of aquatic plants, now usually included under *Alismaceæ*.

BUTOMUS (from *bous*, an ox, and *temno*, to cut; in reference to the sharp leaves, which injure the mouths of cattle that browse upon them). ORD. *Alismaceæ*. A very handsome hardy perennial aquatic, of extremely easy culture on the margins of ponds or muddy banks. Propagated by divisions of the roots, in spring.

FIG. 304. BUTOMUS UMBELLATUS, showing Habit and Single Flower.

B. umbellatus (umbelled).* Flowering Rush; Water Gladiole. *fl.* rose-coloured, umbellate; pedicels with scariose sheathing bracts at the base; scape naked, terete, longer than the leaves. Summer. *l.* all radical, 2ft. to 3ft. long, linear, acuminate, triquetrous. England (ditches and ponds); rare in Ireland. See Fig. 304.

BUTTER AND EGGS. The double-flowered variety of **Narcissus aurantius** (which *see*).

BUTTER AND TALLOW TREE. *See* **Pentadesma.**

BUTTER-BUR. *See* **Petasites vulgaris.**

BUTTERCUPS. *See* **Ranunculus.**

BUTTERFLY ORCHIS. *See* **Habenaria bifolia** and **H. chlorantha.**

BUTTERFLY PLANT. *See* **Oncidium Papilio.**

BUTTER NUT. *See* **Caryocar** and **Juglans cinerea.**

BUTTERWORT. *See* **Pinguicula.**

BUTTON FLOWER. *See* **Gomphia.**

BUTTON-TREE. *See* **Conocarpus.**

BUTTON-WOOD. *See* **Cephalanthus** and **Platanus occidentalis.**

BUXUS (from *pyknos*, dense; referring to the hardness of the wood). Box Tree. ORD. *Euphorbiaceæ*. A genus of hardy evergreen shrubs or small trees. Flowers unisexual, monœcious; male flowers, calyx of four minute segments, stamens four, inserted under the rudiment of a pistil; female flowers singly, at the tips of groups of male ones. Fruit a regma, leathery, beaked with the styles. Leaves simple, opposite, exstipulate. These well-known plants thrive in any light, well-drained soil. Seeds should be sown in similar situations as soon as ripe. Cuttings, made of the young shoots, from 4in. to 6in. in length, inserted in a shady place, in August or September, root readily. Layers of either young or old wood, made in autumn or early spring, will make good plants. They can also be increased by suckers and division.

B. balearica (Balearic).* *l.* yellowish-green, oblong-elliptical, emarginate, coriaceous, about 2in. long, with a cartilaginous margin. *h.* 15ft. to 20ft. South Europe, 1780. This is a handsome species. The cuttings will require a shelter in winter, and in exposed situations it will be better to afford the plants protection.

Buxus—*continued.*

B. sempervirens (evergreen).* Common Box. *l.* oval-oblong, retuse, convex, coriaceous, shining; stalks slightly hairy. *h.* various. England. There are numerous forms of this popular shrub: *argentea*, silver-variegated; *aurea* has its leaves variegated with a golden colour; *marginata* has leaves with a golden margin; *myrtifolia* has small, oblong, narrowish leaves; *obcordata-variegata* is a variegated variety, with obcordate leaves, from Japan; *suffruticosa* is the form usually cultivated for edgings, its leaves are small, obovate, this is readily increased by divisions, and requires to be planted firmly, in order to keep it dwarf.

BYRSONIMA (from *byrsa*, a hide, and *nimius*, much used; because the bark of some of the species is used in tanning, in Brazil). ORD. *Malpighiaceæ*. Ornamental stove evergreen trees or shrubs. Flowers racemose, terminal, simple or branched. All the species thrive very well in any light soil, or a mixture of loam and peat. Cuttings made of half-ripened shoots will root freely in sand, under a hand glass, in a moist bottom heat.

B. altissima (tallest).* *fl.* white; racemes clothed with rufous hairs. July. *l.* ovate-oblong, covered with rufous down beneath, but beset with bristles above, which are fixed by the centre. *h.* 60ft. Guiana, 1820.

B. chrysophylla (golden-leaved).* *fl.* yellow; racemes simple. August. *l.* oblong, short, acuminated, acute at the base, rather wavy on the margin, and revolute, smooth above, clothed beneath with silky down, which is of a rusty golden colour. *h.* 14ft. South America, 1823.

B. coriacea (leathery-leaved). *fl.* yellow, sweet-scented; racemes densely spiked, pubescent, erect. May. *l.* ovate, acute, quite entire and smooth. *h.* 30ft. Jamaica, 1814.

B. crassifolia (thick-leaved). *fl.* yellow; racemes erect, elongated, brownish-velvety. July. *l.* ovate, acute at both ends, at length smooth above, but clothed with brownish down beneath. *h.* 6ft. Guiana, 1793.

B. lucida (shining).* *fl.* pink; petals hastately kidney-shaped; pedicels hispid; racemes spiked, erect, short, smooth. May. *l.* obovate, cuneiform, obtuse, or mucronate, smooth, veinless, shining. *h.* 8ft. Caribbee Islands, 1759. Described as "a beautiful shrub."

B. verbascifolia (Verbascum-leaved). *fl.* yellow; racemes terminal. July. *l.* lanceolate-obovate, quite entire, downy on both surfaces. *h.* 6ft. Guiana, 1810.

BYSTROPOGON (from *byo*, to close, and *pogon*, a beard; in reference to the throat of the flower being closed up with hairs). ORD. *Labiatæ*. Greenhouse evergreen sub-shrubs, nearly allied to *Mentha*. Flowers small, in dichotomous, sub-corymbose, or panicled cymes; or else disposed in dense spicate whorls. Bracts lanceolate or subulate. This genus contains easily cultivated species, which are, however, of no value for garden purposes.

CAA-CUYS. *See* **Ilex paraguariensis.**

CAA-MINI. *See* **Ilex paraguariensis.**

CAAPEBA. *See* **Cissampelos Pareira.**

CAAPIM DE ANGOLA. *See* **Panicum spectabile.**

CAA-QUAZU. *See* **Ilex paraguariensis.**

CABARET. The French name of *Asarum europæum*.

CABBAGE. The common name for *Brassica*; but especially applied to the plain-leaved hearting garden varieties of *Brassica oleracea*. To obtain good tender Cabbages in early spring and throughout the summer, it is necessary that they should be planted on rich, deeply-trenched ground, in a position free from the shade of fruit or other trees. Stable dung or good farmyard manure is best for this crop, and should be applied when trenching is being done, burying the manure a spit below the surface. Cabbages should not be planted successionally on the same ground, nor should they follow any of the other species of *Brassica*, if it can be avoided. A warmer position, not too much sheltered to make the plants tender, will be found beneficial for the earliest spring crop. This should not be planted too soon in autumn, as the plants are more subject to run to seed, especially if the winter be mild. The several forms of Cabbage are well known, being so

Cabbage—*continued.*

much cultivated by cottagers as well as gardeners. None of those forming close hearts will bear severe frost, but the Savoys are improved by a little in the early autumn. The Coleworts are very useful in winter, being perhaps the hardiest of all; and, as the hearts do not get so close and hard as the Savoy and other Cabbages, the frost, unless it is very severe, does not injure them so much.

Cultivation. The crop obtained in April and May is usually the most important one, young Cabbages being then much appreciated by everyone. The time for seed-sowing varies in different localities, from the third week in July to the middle of August. The first date would probably prove suitable for the northern parts of the country; and the latter would be early enough for the south. The seed should be sown thinly in beds of rather light, well pulverised soil, afterwards covering these with netting, to protect the seed from birds. The plants will be ready, in most cases, for placing out during September, or as soon as the ground can be cleared of other crops and prepared for their reception. The Early Battersea, or one of its many allied sorts, is best for sowing at this season; and, when planting out, an allowance of 2ft. apart each way will be sufficient. Seed should again be sown on a mild hotbed in February, and occasionally afterwards, for succession; and a second crop may be obtained from the plants put out in autumn if they are allowed to remain. Drumhead and other strong-growing sorts, sown in spring, will require from 6in. to 1ft. more space when planted out. These are not, however, of such good quality as the smaller-growing varieties.

Savoys. The seed of these should be sown in March or April, according to the locality, in the same way as described above, in seed beds; and the after treatment is also very similar. The young plants must not be allowed to starve in the seed bed, but should be kept watered, and

FIG. 305. SAVOY CABBAGE.

planted out in June and July, choosing dull weather for the operation. The ground should occasionally be hoed between the plants, to keep the surface open and destroy weeds. Distances of from 15in. to 30in. between the plants, according to the variety, must be allowed. See Fig. 305.

Coleworts. Seed of these should be sown about the end of June, and planted out 1ft. apart on a sheltered border,

Cabbage—*continued.*

when large enough. Rosette is one of the best varieties; but the early Cabbages are often grown and used as Coleworts before they have had time to form close hearts.

FIG. 306. EARLY YORK CABBAGE.

Pickling Cabbage. The Red Dutch is the variety generally grown for pickling, and is probably the best to keep its colour when so treated. Seed should be sown in August, to stand the winter, and again in February for a succession; only a few plants will, in the majority of cases, be required, as, if liberally treated, they grow to a good size.

FIG. 307. OXHEART CABBAGE.

Sorts of White Cabbage. These are extremely numerous, and selections or improved forms are of annual appearance. Some of the old types are, however, still much cultivated. The following are a selection of the best sorts for general purposes: Atkins' Matchless, Carter's Heartwell, Early Battersea, Early York (see Fig. 306), Ellam's Early Dwarf, Enfield Market, Little Pixie, Oxheart (see Fig. 307), St. John's Day (see Fig. 308), Sugarloaf, Wheeler's Imperial, and Portugal or Couve Tronchuda. The last-named variety was introduced from Portugal some years ago, where it is

Cabbage—*continued.*

much grown. It has a large midrib, and does not form very close hearts. It is very tender when cooked, and is only suitable for culture in summer. Under the name of Gilbert's Cabbage Broccoli, or Chou de Burghley, a variety of Cabbage was recently distributed which produces, if

FIG. 308. ST. JOHN'S DAY CABBAGE.

left long enough, hearts resembling Broccoli. Although there are different opinions as to its merits, it is said to be very tender when cooked, and is considered a decided acquisition.

Of Savoys, the best are: Drumhead, Dwarf Green Curled, Early Ulm, Large Late Green, and Tom Thumb.

Insects, &c. The majority of the Cabbage tribe is attacked by a very large number of different caterpillars and other pests, both above and below ground. The plants in their young stages are always a prey for snails and slugs, and often require a dusting of soot and lime as a protection. When planting out, many of the plants are often found with a protuberance at the root, caused by an insect, and termed "clubbing." Those so injured should be thrown away if they can possibly be spared, and the others dipped in a thick solution of soot water. This is the worst kind of disease the Cabbage tribe is subject to. The caterpillars of several moths and butterflies are very destructive in summer, often eating through the hearts of Cabbages and Cauliflowers, and so rendering them totally unfit for use. Hand-picking, or dusting with lime, is apparently the only means of diminishing the numbers of these pests.

CABBAGE CATERPILLARS. *Large Cabbage White* (*Pieris brassicæ*). From May to July, and again in September and October, this, the most common of our butterflies, may be seen in great numbers, frequenting gardens, lanes, and fields, being especially numerous where Cabbages are growing. Their beautiful yellow eggs are laid singly on the under surface of the leaves, and securely fastened by a natural glue; from these, in due time, issue the small, but destructive, "green caterpillars." Shortly after birth, they become quite green in front and yellow behind. They then get hairy and dotted over with black; they have eight pairs of feet, of which the three front ones only are "true" legs, or those which ultimately develop into the legs of the butterfly. They change their skin several times, and at each moult become larger in size. When full grown, they are about 1½in. long, of a

Cabbage Caterpillars—*continued.*

light green or bluish hue above, and yellow beneath; along the back of the adult caterpillar is a conspicuous yellow line, edged on each side with black dots.

The chrysalis, or pupa, is commonly found on window-ledges, palings, walls, and similar places; but is sometimes

FIG. 309. CATERPILLAR AND CHRYSALIS OF LARGE CABBAGE BUTTERFLY.

attached to the plant (see Fig. 309). It is a rather curious object, of the colour of stone, and prettily chiselled. It is fastened to the plant by the tail and by a belt of silk round the middle.

FIG. 310. LARGE WHITE CABBAGE BUTTERFLY.

The perfect male insect has the body black and wings white on the upper side, except the tips of the forewings, which are black and crescent-shaped; and on the upper edge of the hinder wings there is a black spot. On the under side, the fore wings are white with yellow tips, and two black patches on each; the hind wings are yellow, with small black markings. The antennæ are alternately black and yellow, with the club black above and yellow beneath. The female (see Fig. 310) differs

FIG. 311. SMALL WHITE CABBAGE BUTTERFLY AND CATERPILLAR.

Cabbage Caterpillars—*continued.*

from the male in having two large black spots on each of the fore or upper wings, and a spot on the inner margin.

The Small White (*Pieris rapæ*, see Fig. 311) has two broods in the year, the first batch about April, and the second in July. The eggs are always placed on the upper side of the leaf, and are hatched in from ten to thirteen days, the caterpillars becoming full grown in about three weeks after emerging. The colour of the caterpillar is dark green, with a fine line of yellow, and a row of yellow spots down the sides The chrysalis is attached by the tail and a band of silk to the place selected by the caterpillar, and varies greatly in colour, although generally it is of a whitish-brown.

Cabbage Moth (*Mamestra brassicæ*). Newman, in his "British Moths," thus describes the Cabbage Moth: "The antennæ are rather long and slender, and scarcely ciliated in either sex; the forewings are dark, smoky, grey brown, mottled and marbled with confused markings, both darker and paler; the orbicular spot is inconspicuous, but decidedly to be traced; the reniform stigma is delicately outlined with white or whitish-grey, and has a pale anterior disc, in which the same pale grey colour predominates; the hind wings are dark, smoky brown with rather pale base, and rather darker crescentic discoidal spot and wing-rays; the head, thorax, and body have the same colour as the fore and hind wings." The eggs are laid on Cabbages, or similar plants, and are hatched in a few days. The caterpillars are very voracious, feeding by day and night, and, what is worse, they spoil with their excrement, in the case of Cabbages, more than they eat. They are of a dark colour, with a kind of marbling, more or less distinct, on the back, the effect being produced by a triangular mark containing two white dots on each of their segments. On being disturbed, they roll themselves into a tight ring, and so remain until they suppose that danger is over. They descend into the earth for change to smooth red-brown chrysalids, and remain there till the following spring. If the chrysalids were collected and destroyed during the autumn and winter digging, much injury would be obviated through the succeeding spring and summer.

The destruction of these pests is a very troublesome matter, as the grubs of the last-named kind bore into the heart of the cabbage. Hand-picking is the only sure method. Anything emitting a distasteful odour will also keep them at bay. Miss Ormerod recommends throwing gas-lime over the plants, but it must be previously weakened by a few months' exposure. The following remedy may also be recommended:

Paraffin, or *Coal Oil.* Mix one ounce of oil with a gallon of soapsuds, and water the plants with the mixture before the caterpillars appear. If any have appeared, an application at the rate of two ounces to the gallon will generally clear them off. Of course, this operation must not be performed less than a month previous to cutting the cabbages, on account of the smell. Soapsuds alone will also clear caterpillars from most smooth-leaved subjects if frequently applied.

CABBAGE FLY (*Anthomyia brassicæ*). Among the injurious insects which infest Cabbages, none commit greater havoc to both stem and root, than the maggots of the Cabbage Fly. "They are whitish, cylindrical, and legless, tapering to the head, and blunt at the tail, which has short teeth on the lower margin, and two brown tubercles in the middle. When full grown, they are about ⅓in. long. They then leave the plants, and turn, in the earth, to pupæ, with a few black spots at the head, and short teeth at the tail, inside which the flies form, and emerge in about a fortnight or three weeks. The fly is of an ashen-grey colour, and smaller than the Onion Fly, which it much resembles. The male is of a darker grey, and has a short black stripe along the back between the wings, with a curved one on each side of it, and one black stripe along the abdomen" (Ormerod). The presence of

Cabbage Fly—*continued.*

these maggots may be easily detected by the flagging and change of colour of the leaves. The infested plants should be immediately removed and destroyed. The following remedy will be found beneficial:

Lime. Hot lime should be soaked in water for about twenty-four hours. When clear, the infested Cabbages should be well washed with the liquid. Superphosphate of lime may also be applied with advantage.

CABBAGE GALL WEEVIL (*Ceutorrhynchus sulcicollis*). This is a pretty little beetle, about three-quarters of a line or one line in length. Its colour is dark, but the insect is really of a coppery hue; on the thorax and head are rather large depressions; the wing-cases vary in colour from green to greenish-blue, or even black, and along the entire length of the elytra are parallel lines or holes, as may be seen with the aid of an ordinary lens. This insect, which causes much damage to plants of the *Brassica* family, is, in some places, very difficult to eradicate. It is also very destructive to other crops, and, therefore, any effectual remedy is valuable. The following methods may be recommended:

Carbolic Acid. Mix 1oz. Calvert's No. 5 carbolic acid with two gallons of soapsuds, and add sufficient loam or clay to make a thin paste. Dip the roots of the whole of the plants into this before they are set out. Well stir the mixture, and put the plants out in a damp soil, so that watering will not be necessary.

Paraffin, or *Coal Oil.* This, applied in the same manner as recommended for Carbolic Acid, is also very good.

Guano, Superphosphate of Lime, and Nitrate of Soda. A good dressing of either of these, given after the ground is dug, and in wet weather, about a month before the plants are put out, has been found very beneficial; but, although preventatives, they do not totally clear the crop from insects for the season.

Soot and Lime. Take equal parts of air-slaked lime and soot, and mix together. Set the plants with a trowel, and, having placed some soil over the roots, throw in a little of the mixture, filling up the hole with soil.

CABBAGE MOTH. *See* **Cabbage Caterpillars.**

CABBAGE PALM. *See* **Euterpe oleracea.**

CABBAGE POWDERED-WING (*Aleyrodes brassicæ*). A small four-winged powdery fly, closely allied to the Aphides. As implied by its name, this pest infests the various sorts of Cabbages. It is more particularly prevalent in autumn. Its presence may be readily detected by the partial discoloration of the leaves attacked. The head and body between the wings are black, with yellow variegation; abdomen yellow or rosy; wings white and mealy (whence its common name), the upper pair each having a darker spot, near the centre. Its destructive power resides in the rostrum, or sucking-tube, with which its head is furnished.

Remedies. The only effectual means of exterminating this pest is to destroy the leaves, preferably by burning. If its presence is detected early, an application of tobacco water, or diluted soft soap, may prove beneficial.

CABBAGE ROOT-EATING FLY. *See* **Root-eating Fly.**

CABBAGE-TREE. *See* **Euterpe oleracea.**

CABBAGE WEEVIL. *See* **Cabbage Gall Weevil.**

CABOMBA (the native name in Guiana). ORD. *Nymphæaceæ*. SUB. ORD. *Cabombeæ*. Small and very interesting aquatics. They thrive well in a cistern 1ft. deep, with 2in. of loam in the bottom, for the plants to root in, then filled up with water, and placed in a warm part of the greenhouse during summer, being allowed a rest in a cool part of the stove in winter. Propagation may be effected by root division.

C. aquatica (water-loving). *fl.* yellow, small; peduncles long, axillary, solitary, one-flowered. July. Submerged leaves opposite, stalked, cut into five divisions even to the petiole; segments

Cabomba—*continued.*

multifid; floating leaves alternate, on long petioles, peltate, orbicular, entire. Guiana, 1823. SYN. *Nectris aquatica.*

C. caroliniana (Carolina) is somewhat similar to *C. aquatica.* It is a native of the Southern United States.

CACALIA (from *Kakalia*, a name used by Dioscorides). ORD. *Compositæ.* A genus of hardy herbaceous perennials, here treated as distinct from *Senecio*, of which genus, from a botanical point of view, it is but a section. Heads five to many-flowered; florets all tubular and perfect; scales of the involucre in a single row; receptacle naked; pappus of numerous capillary bristles. For culture, *see* **Senecio.**

C. atriplicifolia (Atriplex-leaved). *fl.-heads* white. August. *l.*, lower ones triangular-kidney shaped, or slightly cordate; the upper rhomboid, toothed. Stem terete. *h.* 3ft. to 6ft. United States of America.

C. hastata (hastate). *fl.-heads* white, nodding, racemose. Autumn. *l.* stalked, three-lobed, hastate, serrate. *h.* 1ft. Siberia, 1780.

C. reniformis (reniform). *fl.-heads* white, disposed in large corymbs. August. *l.* dilated, fan-shaped, 1ft. to 2ft. broad, repandly-toothed and angled, petiolate. Stem grooved and angled. *h.* 4ft. to 9ft. New Jersey, 1801.

C. suaveolens (sweet-scented).* *fl.-heads* white. Autumn. *l.* triangular-lanceolate, halbert-shaped, pointed, serrate; those of the stem on winged petioles. Stem grooved. *h.* 3ft. to 5ft. North America, 1752.

C. tuberosa (tuberous).* *fl.-heads* whitish. June. *l.* thick; lower ones lanceolate or oval, nearly entire, tapering into long petioles; upper ones on short margined petioles, sometimes toothed at the apex. Stem angled and grooved. *h.* 2ft. to 6ft. North America.

CACOUCIA (its name in Guiana). ORD. *Combretaceæ.* A small genus of stove twining or climbing shrubs. Flowers large, showy, racemose. Leaves opposite, oblong or ovate-elliptical. For culture, *see* **Combretum.**

C. coccinea (scarlet).* *fl.* scarlet, alternate, bracteate at the base, disposed in long terminal racemes. May. *l.* ovate, acuminated, shortly petiolate. Guiana. (A. G. i. 179.) A handsome stove climber.

CACTEÆ. A large order of succulent plants, with remarkable spines clustered on the cylindrical, angular, two-edged, or leafy stems. Flowers very variable, showy or minute, usually solitary, sessile, rarely in fascicles, ephemeral; petals disposed in two or more series, hardly distinguishable from the inner sepals, and sometimes united with them; sepals numerous, united and adnate a great length to the ovarium. Fruit fleshy, one-celled, many-seeded. Well-known genera are *Melocactus*, *Mammillaria*, *Opuntia*, *Pereskia*, and *Rhipsalis.*

CACTUS (from *Kaktos*, a name used by Theophrastus to describe a spiny plant). This generic term is popularly applied to all members of the extensive family *Cacteæ*, which order may be distinguished by the following characteristics: Calyx composed of many sepals, usually indefinite in number, the inner series not readily distinguishable from the petals, united and adnate a great length to the ovary; with the tube smooth in the genera *Mammillaria*, *Melocactus*, and *Rhipsalis*; or with the lobes of the sepals crowning the fruit, and having the tube scaly, as in the genera *Cereus*, *Opuntia*, and *Pereskia.* Petals disposed in two or more series, hardly distinguishable from the inner sepals, and somewhat united to them; sometimes irregular, and disposed in a long tube at the base, but distinct at the apex, as in the genera *Mammillaria*, *Melocactus*, and *Cereus*; sometimes equal and distinct to the very base, forming a rotate corolla, as in the genera *Opuntia*, *Pereskia*, and *Rhipsalis.* Stamens indefinite, disposed in many series, more or less cohering with the petals or inner sepals; filaments slender, filiform; anthers ovate, versatile, two-celled. Ovarium obovate, fleshy, one-celled. Fruit fleshy, one-celled, many seeded, either smooth and crowned by the calyx, or covered with scales, scars, or tubercles, and umbilicate at the apex. This order contains fleshy or succulent shrubs, very variable in habit and size. Flowers very variable, showy, or minute, usually solitary, sessile, rarely in fascicles, ephemeral, expanding by night or day. Leaves usually wanting, but, when present, small,

Cactus—*continued.*

caducous, and terete, rarely flat and expanded, sometimes alternate and disposed in a spiral order, always glabrous and fleshy. Prickles or bristles disposed in fascicles, rising from the axils of the leaves. In the leafless genera, the fascicles of spines are disposed on the angles of the stem, rising from tubercles. Stems usually angular, winged, or regularly beset with tubercles, rarely terete, usually jointed; joints compressed. A group of Cacti is shown at Fig. 312, for which we are indebted to Herr Fr. Ad. Haage, jun., of Erfurt, Germany. *See* **Cereus, Disocactus, Echinocactus, Epiphyllum, Leuchtenbergia, Mammillaria, Melocactus, Nopalea, Opuntia, Pelecyphora, Pereskia, Phyllocactus,** and **Rhipsalis.**

Cultivation. Perhaps no class of plants more easily accommodate themselves to a general system of treatment, than do these; although certain genera would undoubtedly thrive better than when subjected to the lower temperature, suited to the requirements of those coming from cooler regions. Notwithstanding that nearly all the species are natives of the western hemisphere, they occur in various geographical and altitudinal areas, in which the temperature is proportionately lessened or increased, as the case may be; yet, presuming a special house is set apart for their culture, the majority of the species may be happily suited therein. The warmest end of the structure should be selected for the tropical kinds; while those found in cooler regions may be grown in the other portions of the house; even those which are hardy in our climate are really best wintered in a house or frame. Granted that several species will endure our winter outside, it is yet necessary to give them the shelter of a friendly ledge of the rockery, or frame, or to cover them in their permanent position with a hand light, or sheet of glass, in order to prevent the ill-effects of excessive moisture. Generally, a winter temperature of from 50deg. to 55deg., and a summer one of from 70deg. to 80deg. during shade, or in sunshine up to 90deg., will be found advantageous. When thus treated, it will be necessary to keep the tropical species, on the whole, very dry during the winter. As regards soil, potting, and general treatment, all may be treated alike, except *Epiphyllum*, *Disocactus*, and *Pereskia* (which *see*). Some growers give them the protection of a house in winter, and stand them outside during the summer, which is not, however, a very commendable plan, as, in consequence of the very variable character of our climate being especially prejudicial to several of the tender and more delicate species, the often excessive amount of moisture they would receive, will produce a weakly state of health in many, while others will be lost. It is far better if their culture is attempted at all, to give them the proper treatment. The numerous species and varieties found on the Rocky Mountains are a most interesting series, and may be well managed in a cold frame facing south, arranging them on shelves as close to the glass as possible, and keeping them very dry through the winter. If the weather is very severe, the lights should be matted. One of the best collections of these in the country, is in the possession of E. G. Loder, Esq., Floore House, Weedon, Northampton, where a great number are admirably grown in frames, and under a large ledge of the rockery outside. Amateurs may grow quantities of handsome Cacti either in dwelling rooms near the window, or in small frames or greenhouses. As they are slow growing, not much space will be occupied; at the same time, a great deal of interest will be centred in their culture. As regards watering and insect pests, they are but little trouble. Miniature Cacti, of numerous kinds, are now often sold in small pots, and most attractive little subjects they prove.

Soil, Drainage, and Potting. Good ordinary fibrous loam should form about one-half of the compost, the other half should be made up of sand, broken bricks, and lime rubbish in equal quantities; the whole to be carefully mixed together, and not used until it is moderately dry. It is

Cactus—*continued.*

absolutely necessary to ensure perfect drainage; a good "stopper" should, therefore, be placed over the hole at the bottom of the pot, and about one-third of its depth filled with draining material. The best time for potting is during February and March. Turn out the plants, and remove nearly all the old soil from the roots, taking away any dead

Cactus—*continued.*

vessels. A good top-dressing, with an occasional dose of weak liquid manure, is all they will require for several seasons.

Watering. This must be discriminately managed, especially during the winter; for, whatever their treatment as regards temperature during that season, they must be

1. Opuntia.
2. Cereus.
3. Opuntia streptacantha.
4. Cereus candicans.
5. Mammillaria.
6. Cereus peruvianus monstrosus.
7. Cereus electracanthus.
8. Mammillaria.
9. Echinopsis formosa.
10. Echinocactus Visnaga.
11. Cereus peruvianus var.
12. Opuntia candelabriformis.
13. Cereus strictus.
14. Pilocereus senilis.
15. Cereus Tweedii.
16. Cereus chilensis.

FIG. 312. GROUP OF CACTI.

or decaying roots which may be observable. Place some of the roughest soil next the crocks, and gradually fill the pots with the finer material, well working the same amongst the roots; finally press the soil moderately firm. Do not water for a few days after potting, but syringe every evening, especially if the weather be fine; a little extra heat may be given after potting, to excite new, healthy growth. It will not be necessary every year to repot specimens in large

studiously watered, and anything like a saturated condition of the soil should be avoided. If the temperature is brisk, a little water may be given once a week, or perhaps not quite so often. If the plants are subjected to very cool treatment, water must be sparingly administered during November, December, and January; after which, they should be examined weekly, and very carefully attended to. During the summer months, when in active

Cactus—*continued.*

growth, they will not suffer if watered twice a week; and, on bright afternoons, light syringings may be advantageously given.

Propagation. Three methods are adopted, viz., by cuttings or offsets, grafting, and seeds; the former is the plan generally adopted. The cuttings or offsets should be removed with a sharp cut, and laid upon a sunny shelf until the wound is healed and roots are emitted, when they should be potted in sandy soil, and placed with the others. They will thrive freely if kept syringed. Grafting is resorted to with delicate kinds, which, from some reason or another, will not grow freely except upon the stock of a stronger species; and, by this means also, such delicate kinds can be kept from the damp soil, which frequently causes incipient decay. The stocks usually employed are those of *Cereus tortuosus, C. peruvianus,* &c., according to the species intended for working; they readily unite with each other. If the scion and stock are both slender, wedge-grafting should be adopted; if both are broad, it is best to make horizontal sections, placing them together and securing in proper position by tying with matting, but not too tightly, or the surface may be injured. Propagation by seeds is not often adopted, as it is a very slow method; they should be sown in very sandy soil, and placed in a semi-shady position until germination commences, when they may be exposed, and very carefully watered.

CACTUS DAHLIA. *See* **Dahlia Juarezii.**

CADUCOUS. Falling off soon; deciduous.

CÆNOPTERIS. *See* **Asplenium.**

CÆSALPINIA (in honour of Andreas Cæsalpinus, a celebrated Italian botanist, 1519—1603). Brasiletto. ORD. *Leguminosæ.* An ornamental genus of stove evergreen trees or shrubs, not much grown, on account of the space required and the time the species take to flower. Flowers yellow or red, produced in racemes, having a top-shaped calyx, divided at the end into five parts, the lowest larger than the others; petals five, unequal-stalked, upper one shortest; stamens ten. A mixture of loam and leaf mould suits them best. Cuttings are somewhat difficult to root, but sometimes will succeed if taken off from the mother plant in a growing state and planted in sand, with a hand glass placed over them, in heat.

C. alternifolia (alternate-leaved). *fl.* orange, clustered. *l.* alternate, very elegant, compound. Central America, 1868.

C. brasiliensis (Brazilian). Brazil Wood. *fl.* orange; racemes rather panicled. *l.* with seven to nine pairs of pinnæ, each pinna bearing about fifteen or sixteen pairs of oval-oblong, obtuse, glabrous leaflets. Brazil, 1739. Plant unarmed.

C. Sappan (Sappan). *fl.* yellow, panicled. *l.* with ten to twelve pairs of pinnæ, each pinna bearing ten to twelve pairs of unequal-sided, obliquely oval-oblong leaflets, which are emarginate at the apex. *h.* 40ft. Tropical Asia, 1773. This tree furnishes the Sappan-wood of commerce.

C. sepiaria (hedge). *fl.* yellow. April. *l.* compound; pinnæ with about ten pairs of pinnules. *h.* 60ft. India, 1857. SYN. *Biancea scandens.*

CÆSIOUS. Lavender-colour, bluish-grey.

CÆSPITOSE. Growing in tufts.

CAFFER BREAD. *See* **Encephalartos Caffra.**

CAFFER TEA. *See* **Helichrysum nudifolium.**

CAFTA. *See* **Catha edulis.**

CAHOUN NUTS. A name applied to the fruits of *Attalea Cohune,* which yield a valuable oil.

CAIOPHORA. *See* **Blumenbachia** and **Loasa.**

CAJAN. *See* **Cajanus.**

CAJANUS (*Catjang* is the Amboyna name). Cajan. ORD. *Leguminosæ.* A genus of erect stove evergreen shrubs, clothed with velvety pubescence. Flowers yellow, distinctly peduncled, corymbose, racemose; standard sometimes beautifully veined with red. Leaves pinnately

Cajanus—*continued.*

trifoliate. A light rich soil suits these plants well. Young cuttings will root in sand, with a hand glass placed over them, in heat; but plants are usually raised from seeds, obtained from the West Indian Islands and India.

C. indicus (Indian).* Pigeon Pea. *fl.* yellow, or purple-spotted, in axillary racemes. July. *l.* pinnately trifoliolate; leaflets lanceolate. *h.* 6ft. to 10ft. India. (B. M. 6440.)

C. i. bicolor (two-coloured). *fl.* yellow. July. *h.* 4ft. India, 1800. (B. R. 31, 31.)

C. i. flavus (yellow). *fl.* yellow. July. *h.* 4ft. India, 1687.

CAJUPUT OIL and **CAJUPUT-TREE.** *See* **Melaleuca leucadendron minor.**

CAKILE (derived from the Arabic). Sea Rocket. ORD. *Cruciferæ.* A pretty hardy annual, frequently found on sea-shores. It is of easy culture in most sandy soils. Propagated by seed, sown in spring.

C. maritima (sea). *fl.* lilac, large, densely corymbose. Summer and autumn. *fr.* a succulent pod, divided, when mature, by a horizontal partition into two cells, the upper containing a single erect seed, the lower a pendulous one. *l.* oblong, deeply lobed, fleshy. Stem much branched. *h.* 1ft. Sea-shores of Europe and North America.

CALABASH NUTMEG. *See* **Monodora Myristica.**

CALABASH, SWEET. *See* **Passiflora maliformis.**

CALABASH-TREE. *See* **Crescentia Cujete.**

CALABA-TREE. *See* **Calophyllum Calaba.**

CALADENIA (from *kalos,* beautiful, and *aden,* a gland; in reference to the disk of the labellum being finely beset with glands). ORD. *Orchideæ.* A genus of pretty greenhouse terrestrial Orchids from New Zealand and Australia. They should be kept in a cool frame or greenhouse, and carefully watered, when not in a growing state. A compost of peat, loam, and sand, in equal parts, suits them well. Over thirty species are enumerated, but probably none are seen out of botanic gardens.

CALADIUM (derivation of name doubtful; probably of Indian origin). ORD. *Aroideæ* (*Araceæ*). Stove perennials, chiefly grown for the beauty and varied hue of their leaves. Spathe hood-like, rolled round at the base; spadix, upper portion entirely covered with stamens, but ultimately becoming bare at the extreme top, provided with blunt glands or sterile stamens in the middle, and ovaries beneath; anthers shield-shaped and one-celled; ovaries numerous, two-celled, with from two to four ascending ovules in each cell. Leaves upon long petioles, more or less sagittate, ovate, and usually very richly coloured. Fruit a one or two-celled berry, with few seeds. They are all of easy culture, and grow freely in a humid atmosphere. In March, when the tubers have been kept dry or rested for some time, they may be started into growth again, in small pots, placed in a stove or pit, where a night temperature of from 60deg. to 65deg. is maintained, and syringed daily once or twice at least. As soon as indications of activity are presented, they may be shifted into 4in., 5in., or 6in. pots, or larger ones may be used if good sized specimens are required. If the tubers should be in large pots, it is best to turn them out, dividing if necessary, and placing all the crowns in small pots, from which they can be removed when root action and growth are resumed, and they require more room. Large tubers, if sound, may be divided, and the pieces placed in pots of such sizes as it is desired to grow them in.

Soil. Turfy loam, leaf mould, turfy peat, and a little well decomposed manure, in equal parts (not broken up too fine), with a good sprinkling of sharp sand, form an excellent compost, the whole being well incorporated together. Thorough drainage must be insured, as these plants require an abundance of water. After potting, they should be placed in a stove temperature, and kept well moistened by syringing two or three times daily. If accommodated with mild bottom heat at this time, they will make much

Caladium—*continued.*

freer and more vigorous growth than if otherwise treated. Water sparingly at first, but as soon as the leaves expand, increase the supply; and, when the pots are well filled with roots, apply clear liquid manure at every other time of watering. As the season advances, the temperature and humidity of the house should be increased. During bright sunshine, Caladiums should be slightly shaded for a few hours in the middle of the day, with some thin material, just to break the fierceness of the sun's rays; but the more they are exposed to the light at other times during growth, the brighter, richer, and more beautiful will the foliage be. As soon as the plants have attained a good size, some of them should be placed in the coolest part of the house, and partially hardened off; they may then be taken to the conservatory, allowing them a situation free from currents of cold air, and giving water only when really necessary. They may remain here for some time, but care must be taken to return them to the stove before they suffer from cold.

Small neatly grown specimens make beautiful ornaments for table decoration, and their suitability for exhibition purposes is well known, and largely taken advantage of. Towards autumn, and as the foliage begins to fade, the supply of water should be gradually lessened, until all the leaves die down; the pots should then be placed under the stage in the stove, where they can be looked to now and then, and a little water given if required. By no means allow the tubers to get dried up, as is often done; for, if so, they will frequently rot away inside; whereas, kept in a semi-moist condition, even the most delicate can be preserved. In this state, they may remain until the following season. Caladiums will not endure a very low temperature; from 55deg. to 60deg. is as low as they can be safely kept. Very few of those known as "true species" are grown, being superseded, for general decorative purposes, by the numerous hybrids which have been raised of late, principally from *C. bicolor.*

FIG. 313. CALADIUM CHANTINII.

C. argyrites (silvery).* *l.* small, sagittate, ground colour light green; centre and margins white, with many irregular white blotches scattered over the remaining portion. Para, 1858. One of the smallest and most elegant of the genus, and much esteemed for table decoration. (I. H. 1858, 185.)

C. Baraquinii (Baraquin's). *l.* from 20in. to 30in. long; centre deep red; margin dark green. Para, 1858. (I. H. 1850, 257.)

C. bicolor (two-coloured).* *A.*, spadix shorter than the hooded spathe, which is contracted in the middle. June. *l.* peltate-

Caladium—*continued.*

cordate, sagittate, coloured in the disk. *h.* 1ft. Brazil, 1775. (B. M. 820.)

C. Cannartii (Cannart's). *l.* green, with pale blotches; veins deep red. Para, 1863.

C. Chantinii (Chantin's).* *l.* chiefly brilliant crimson, irregularly blotched with white, and margined with dark green. Para, 1858. See Fig. 313.

C. Devosianum (Devosie's).* *l.* angular, blotched white and pink. Para, 1862.

C. esculentum (edible). Synonymous with *Colocasia esculenta.*

C. Hardii (Hardy's). *l.* red-tinged, slightly spotted with white. Para, 1862.

C. Kochii (Koch's).* *l.* spotted with white. Para, 1862.

C. Lemaireanum (Lemaire's). *l.* green, with whitish venation. Brazil, 1861. (I. H. 1862, 311.)

C. Leopoldi (Prince Leopold's).* *l.* green, marbled with red, and blotched with pink. Para, 1864.

C. macrophyllum (large-leaved).* *l.* large, palish green, blotched with greenish-white. Para, 1862.

FIG. 314 CALADIUM MACULATUM.

C. maculatum (spotted).* *l.* oblong, acuminate, cuspidate, cordate at base, finely spotted with clear white. Plant erect, caulescent. South America, 1820. See Fig. 314.

C. marmoratum (marbled).* *l.* broad, peltate, upwards of 1ft. long, sagittate-ovate, acute or shortly acuminate, the two basal lobes being slightly divergent, dark bottle-green, variegated with greyish or silvery angular spots and blotches; petioles terete, greenish, mottled with purple. Guayaquil. SYN. *Alocasia Roezlii.* The variety *costata* differs from the type in having the midrib (or costa) marked out by a tapering band of silver grey.

C. Rougieri (Rougier's). *l.* green, with white spots; the centre pale green, with red veins. Para, 1864.

C. rubronervium (red-nerved). A synonym of *C. rubrovenium.*

C. rubrovenium (red-veined).* *l.* greyish-green in the centre, with red veins. Para, 1862. SYN. *C. rubronervium.*

C. sanguinolentum (blood-red blotched).* *l.* with a white midrib, blotched with red. Amazons, 1872.

C. Schoelleri (Schoeller's). A synonym of *C. Schomburgkii.*

C. Schomburgkii (Schomburgk's).* *l.* green, with white veins. Brazil, 1861. SYNS. *C. Schoelleri* and *Alocasia argyroneura.*

C. S. Schmitzii (Schmitz's). *l.*, centre whitish, with green network; midrib and veins red. 1861. SYN. *Alocasia erythræa.*

Caladium —*continued.*

C. sub-rotundum (half-round). *l.* roundish, spotted with red and white. Brazil. 1858.

C. Verschaffeltii (Verschaffelt's).* *l.* somewhat heart-shaped; ground colour brilliant green, entire surface irregularly spotted with bright red. Para.

C. Wallisii (Wallis's). *l.* dark olive green, with large irregular shaped spots and blotches of the purest white, and the veins all yellowish-white. Para, 1864.

The following descriptive list of hybrid varieties is, for the most part, a selection from Mr. Bull's catalogue, and contains all of importance:

ADOLPHE ADAMS, green leaf-ground, densely speckled with white, and rose-coloured midribs; ADOLPHE AUDRIEN,* a very attractive variety, with fine large richly-coloured foliage; AGRIPPINE DIMITRY, leaves large, with white ground, narrow green margin and veins, and pink centre; ALCIBIADE,* crimson-rayed centre, surrounded with pale green, and blotched with pure white, green margin; ALFRED BLEU, leaves rich green, with pure white spots, and flesh-coloured centre; ALFRED MAME,* carmine-red, bordered with white, and profusely spotted with rose; ALPHAND, green, spotted with red, crimson centre; ALPHONSE KARR, rosy-carmine centre and red spots; ARISTIDE, light green, with crimson centre; AUGUSTE LEMONIER,* fine large leaves, with soft green centre, and rosy-crimson ribs and veins; AUGUSTE RIVIERE, white centre and rays upon a light green ground, with crimson spots; BARILLET,* bright rosy-crimson centre, and ribs on green ground, with broad margin of rich green; BARON DE ROTHSCHILD, rich blood-red centre, and spots, on mottled green leaf-ground; BARONNE JAMES DE ROTHSCHILD,* young leaves of a bright rose colour, the more matured foliage soft rose, with red veins; BARRAL, bright green, with a fine red centre, and large spots of rose; BEETHOVEN,* ground colour white, intersected and veined with green, centre rib delicate rose; BELLEYMEI,* fine white variegated leaves; BELLINI, mottled pale green ground, with rosy centre and spots; BLANQUÆRTI, dark green, with grey veins and white spots; BUREL, dark bluish-green, veined bright rose, marked with rosy-violet, and spotted orange-red; CHANTINII FULGENS,* rich dark metallic-green, with attractive crimson centre and white spots; CHELSONI,* bright glossy green, suffused with brilliant red, and blotched with crimson; CLIO, ground colour deep rose, shaded white, green ribs and narrow green margin; DE CANDOLLE,* rich green, with beautiful rose-coloured spots and creamy white centre rays; DE HUMBOLDT, a fine variety, having glossy green leaves, spotted with scarlet; DEVINCK, leaves heart-shaped, delicate pink centre ribs, interspersed with white spots; DR. BOISDUVAL, centre rayed crimson, snow-white blotches on a green ground; DR. LINDLEY,* crimson centre, the green ground marked with rose blotches; DUC DE CLEVELAND, deep red centre, surrounded with pea-green, largely spotted with red; DUC DE MORNY,* deep green leaf borders, with large crimson-rayed centre; DUC DE NASSAU,* brilliant red centre and ribs, white spot on emerald green leaf borders; DUC DE RATIBOR, green ground, with red midribs marked with white spots; DUCHARTRE, leaf-ground white, flushed rose, green veins and red spots; EDOUARD ANDRE, crimson centre, and rose blotches; EDOUARD MOREAUX, mottled green ground, with lake centre; EDOUARD RODRIGUES,* deep carmine, margined with light green, and spotted with rose; E. G. HENDERSON,* green, with transparent rose spots and mottled crimson rays and centre; ELVINA, bright green, blotched with red, grey centre and veins; EMILIE VERDIER,* leaves of a light transparent rose colour, spotted with red; ETOILE D'ARGENT,* bright green, midribs and veins creamy-white, shaded with grey; EUCHARIS, rose centre, with violet reflections, margined with bright green, very fresh and bright looking; FELICIEN DAVID,* centre of leaf dark carmine, surrounded with white and beautifully veined with red on a light green ground; GOLDEN QUEEN, leaves large, pale golden yellow, uniform in colour; GRETRY, carmine centre, with white spots on a dark green ground; HELEVY, white midribs and marked with crimson blotches, on a green ground; HEROLD,* dark carmine veins, surrounded by light green, blotched with pure white, and margined dark green; IBIS ROSE,* a magnificent variety, with beautiful rich rose-coloured foliage, extremely attractive; ISADORA LEROY, rich metallic green, with crimson-red centre rays; JULES DUPLESSIS, bright rose centre, shaded with rich red and bordered with green; JULES PUTZEYS, rich green, with crimson midrib and veins, centre mottled grey, and the whole surface blotched with red; LAINGII,* reddish-carmine centre, surrounded with yellowish-green, the whole of the leaf sprinkled with white; LAMARTINE, deep crimson centre, with white and red spots; LA PERLE DU BRÉSIL,* exceedingly attractive, large leaves, white, delicately tinted with rose, midrib and veins dark green; LEPLAY, leaves attractively marked with white, and beautifully veined with rosy-violet; LOUISE DUPLESSIS, red rays and veins on a white ground, green margin; LUDDEMANNII,* deep crimson ribs, the leaf blotched with magenta and white, border pea green; MADAME ALFRED BLEU, deep green, with large white blotches, and broad crimson-scarlet veins; MADAME ALFRED MAME, light green, covered with large white spots, rosy-carmine centre; MADAME DE LA DEVANSAYE, leaves white, shaded rose, and veined with red and green; MADAME DOMBRAIN,* centre and ribs pale yellowish-green, shaded rose, surface covered with large white and rose spots; MADAME FRITZ KŒCHLIN,* white ground, with violet-rose ribs and green veins, a beautiful dwarf-growing

Caladium—*continued.*

variety; MADAME HEINE,* silvery white, stained and edged with pale green, distinct; MADAME HUNNEBELLE, leaves veined with light garnet colour on a white ground, and margined with green veins; MADAME JULES MÉNOREAU, fine large leaves, with white centre tinted rose, veined rich bright rose, and margined green; MADAME LAFORGE, centre and ribs reddish-crimson, with green margin; MADAME MARJOLIN SCHEFFER,* a beautiful variety, with white foliage, charmingly veined and netted with pure rosy-lake; MADAME WILLAUME, a charming variety, with transparent leaves, of a delicate salmon-rose colour; MARQUIS DE CAUX, red centre and veins, with rose blotches on margins; MARTERSTYGINUM, crimson centre and white spots; MERCADANTE, pale copper-coloured centre and veins, bordered with green; MEYERBEER,* white leaf-ground, green veins, and red midribs; MINERVE,* silvery white midrib and rays, surrounded with greyish white, green margin, with snowy white spots; MITHRIDATE, ground colour crimson-lake, with darker ribs, and dark bronze-green margin; MONSIEUR A. HARDY, rich reddish-carmine veins on white ground, tinted with rose and spotted with green; MONSIEUR J. LINDEN,* a fine large whitish leaf, with metallic reflections, coral-rose veins, and reticulated green border; MRS. LAING,* white ground, deep rose centre and veins, green margin; MURILLO,* centre and veins metallic-red, with large crimson blotches, broad margin of lustrous bronzy-green; NAPOLEON III.,* flamed crimson centre, with forked rays, and carmine spots on green ground; ONSLOW, deep rosy-crimson centre, with broad green margin, spotted with rose; PAILLET, crimson centre, broad green margin, splashed with crimson, and dotted with white; PAUL VERONESSE, large leaves, with pinkish-white centre, deep scarlet ribs, and broad green margin; PHILIPPE HERBERT, deep mottled crimson rays, and clear white margin, spotted with crimson; PICTUM, green blotched, and spotted with white; PRINCE ALBERT,* dark emerald green, rich crimson midrib, radiating from centre to margins, the intervening spaces spotted with white; PRINCE OF WALES,* a very handsome variety, with large golden-yellow leaves; PRINCESS ALEXANDRA,* rosy-salmon leaf, green centre rib, bordered with magenta-crimson, green margin, with light pink chain; PRINCESS OF TECK,* ground colour bright orange-yellow, the veins suffused with deep red; PRINCESS ROYAL, leaves of a golden ground, with crimson centre; PYRRHUS, centre and ribs deep crimson, pea-green margins; QUADRICOLOR, centre of leaf pale yellowish-green, ribs white, edged rosy-crimson, and margined green; RAMSAU, centre and ribs deep reddish-crimson, surface covered with white blotches, shaded red; RAULINII, rich red centre and veins, finely spotted with white; REGALE, silvery grey centre, rosy-red ribs, spotted with vermilion-red; REINE MARIE DE PORTUGAL,* violet-rose centre, with red veins, dark maroon zone, and green border, very handsome; REINE VICTORIA,* green veins and margins, spotted or marbled with white and rich crimson; ROSSINI, large leaf, with pale centre, pink midribs, and red blotches; ROUILLARD, glossy green margin, pale green centre, midrib and rays rich violet-plum, the whole leaf spotted crimson; SANCHONIANTHON, crimson centre, deep glossy crimson ribs, and pea-green margin; SIEBOLDII, rich green, with fiery-red crimson-rayed centre, green spaces, spotted with claret red; SOUVENIR DE MADAME E. ANDRE,* large deep green leaves, marbled with pure white, veins fine rosy crimson; SPONTINI, pea-green, with white spots, and rosy-pink ribs and veins; THIBAUTII, fine large leaf, with rich crimson veins on a red ground; TRICOLOR, edges of leaves grey-green, intersected with dark green, centre red-lake, carmine midribs; TRIOMPHE DE L'EXPOSITION,* crimson centre, with red ribs, and green border; VERDI, crimson-lake centre with small green zone and apple-green margin; VESTA, greenish-white veins, surrounded with crimson, the whole of the leaf spotted bright rose; VICOMTESSE DE LA ROQUE-ORDAN, red midrib, and rays bordered with white, the margin beautiful emerald green; VILLE DE MULHOUSE, a beautiful variety, with greenish-white leaves, shaded rose, and rich green centre; VIRGINALE,* clear shining white, veined with dark bluish-green, a handsome variety.

CALAMAGROSTIS (from *calamos*, a reed, and *agrostis*, grass). ORD. *Gramineæ*. A widely-distributed genus of grasses, for the most part hardy. Panicle more or less spreading; spikelets compressed, one-flowered; empty glumes two, sub-equal, lanceolate, pointed, keeled, awnless. The species thrive in any ordinary garden soil. Propagation may be effected by seeds, sown during autumn.

C. lanceolata (lanceolate). *fl.* purple, spreading in all directions; panicle erect, loose, much branched. July. Culms about 3ft. high, smooth, slender. Britain (moist woods and hedges). (Sy. En. B. 1724.)

C. stricta (upright). *fl.* brown, spreading in all directions; panicle erect, close. June. Culm about 2ft. high, very slender, smooth. England, &c. (bogs and marshes), but very rare. (Sy. En. B. 1725.)

CALAMINT. *See* **Calamintha.**

CALAMINTHA (from *kalos*, beautiful, and *Mintha*, Mint). Calamint. ORD. *Labiatæ*. A genus of hardy

Calamintha—*continued.*

herbaceous plants, having the following essential characters: Calyx two-lipped; stamens diverging; upper lip of corolla nearly flat; tube straight. Rather pretty plants, with Thyme-like flowers, well suited for furnishing rock gardens. They grow in almost any garden soil. Increased by seeds, cuttings, or divisions of the roots, in spring.

C. Acinos (Acinos). Basil Thyme. *fl.* bluish-purple, variegated with white and dark purple, disposed in whorls, one on each flower-stalk. July and August. *l.* acute, serrate. Stems branched, ascending, leafy. *h.* 6in. England. Annual. SYNS. *Acinos vulgaris* and *Thymus Acinos*. (Sy. En. B. 1048.)

C. alpina (alpine). *fl.* purplish, almost sessile, four to six in a whorl, June to September. *l.* petiolate, roundish or ovate, slightly serrated. *h.* 6in. S. Europe, 1731. A freely branched, tufted plant.

C. grandiflora (large-flowered).* *fl.* purplish, 1½in. long, in loose racemes; throat much inflated. June. *l.* petiolate, ovate, acute, coarsely toothed, rounded at the base, 2in. to 3in. long. Herbaceous stems branched at the base, and decumbent. *h.* 1ft. 1596.

C. patavina (Paduan). *fl.* pale or purplish-red, rather large. June. *l.* petiolate, ovate, acute, pubescent. *h.* 6in. to 9in. S. Europe, 1776.

CALAMPELIS. *See* **Eccremocarpus.**

CALAMUS (from *kalamos*, a reed; old Greek name used by Theophrastus). ORD. *Palmæ*. An elegant genus of stove Palms. Flowers small, usually of a rose or greenish colour, clustered upon branching spikes, each branch having a separate spathe, which is not large enough to enclose it. Fruit one-seeded, and covered with smooth, shining scales. Leaves pinnate. Stems reed-like, 1in. to 2in. in thickness. When in a young state, these palms are most effective as drawing or diningroom decorations; and, when in a more mature condition, they are excellent as stove ornaments and for exhibition purposes. They are all of slender growth, and of easy culture in a compost of equal parts loam and vegetable mould; a copious supply of water being needed to keep them in a flourishing state. Propagated by seeds. *C. Rotang*, *C. viminalis*, and several other species furnish the canes usually employed in this country for the bottoms of chairs, couches, &c.

C. accedens (yielding). *l.* long, arching, dark green, pinnate; pinnæ long, narrow, closely set; petioles with slender black spines. India. A rare, but elegant, slender-growing, miniature tree.

C. adspersus (scattered). *l.* pinnate; pinnæ 6in. to 8in. long, narrow, deep green; petioles about 6in. in length, sheathing at the base, clothed with long, slender, black spines. Stem not much stouter than a large wheat straw. *h.* 20ft. Java, 1866.

C. asperrimus (very rough).* *l.* pinnate, 3ft. to 12ft. long; pinnæ 1ft. to 2ft. in length, 1in. in breadth, pendent, light green, upper side with two rows of hair-like spines; petioles broadly sheathing at the base, densely armed with long, stout, black spines. Java, 1877. A beautiful species, which attains a considerable size. (I. H. 275.)

C. ciliaris (fringed).* *l.* pinnate, clothed with a quantity of soft hair-like bristles; petioles sheating at the base. Stem erect and slender. India, 1869. From the plume-like habit of the leaves, it makes a splendid plant for table decoration, as well as being a beautiful specimen for exhibition.

C. draco (dragon). *l.* 4ft. to 6ft. in length, beautifully arched, pinnate; pinnæ 12in. to 18in. long, narrow, slightly pendent, dark green; petioles sheathing at base, armed with long, flat, black spines. *h.* 20ft. to 30ft. India, 1819. A very handsome species, with a robust constitution.

C. fissus (cleft). *l.* ovate in outline, pinnate, when young bright cinnamon; leaflets pendent, dark green, bearing on the upper side a few black hair-like bristles; petioles armed with dark, stout spines. Borneo. A very ornamental species.

C. flagellum (whip-like). *l.* 6ft. to 8ft. in length when fully grown, pinnate; pinnæ pendent, about 1ft. in length and 1in. in breadth, dark green, furnished on the upper side with two rows of long, white, hair-like spines; petioles sheathing, copiously armed with stout white spines, much swollen at the base, and tipped with black. Stem slender.

C. Hystrix (bristly). *l.* pinnate; petioles spiny. A compact-growing and very graceful species.

C. Jenkinsianus (Jenkins's). *l.* pinnate, gracefully arched, 2ft. to 6ft. long; pinnæ 6in. to 12in. long, 1in. broad, rich dark green; petioles slightly sheathing at the base, armed with long flat spines. Sikkim.

C. leptospadix (slender-spadix).* *l.* pinnate; pinnules about ¼in. wide, and from 6in. to 12in. long, subulately acuminate; upper

Calamus—*continued.*

surface with three bristle-bearing ribs; a few smaller bristles are disposed along the midrib underneath; margins finely and regularly toothed with small ascending bristles; petiole channelled, tomentose towards the base, bearing three or four solitary needle-like spines, about 1in. long. India. A rare species, and described as one of the most graceful.

C. Lewisianus (Lewis's).* *l.* ultimately spreading, 2ft. to 6ft. long, pinnate; pinnæ equidistant, ½in. broad, and from 13in. to 15in. long; veins on the upper surface bristled, under surface smooth; margins rough, with appressed bristles; petioles white, with a broad, sheathing, blackish-brown base, densely armed with long, flat, black spines. India. A fine, but somewhat rare, species.

C. Rotang (Rotang). *l.* pinnate, from 3ft. to 4ft. in length, very gracefully arched; pinnæ 6in. to 12in. long, less than 1in. broad; upper side dark green, with two rows of hair-like spines; petioles and stems armed sparingly with stout, slightly reversed spines. Stems slender. India. When young, especially, this plant is very handsome.

C. Royleanus (Royle's).* *l.* pinnate, arching; pinnæ very numerous, narrow, pendent, deep green; petioles with few spines, dark green. North-west Himalayas.

C. spectabilis (showy).* *l.* pinnate, with a few pairs of smooth linear-lanceolate, three-ribbed leaflets, measuring 6in. to 8in. long; petioles green, furnished with numerous short conical white spines, tipped with brown. Malacca. A slender-growing species.

C. verticillaris (whorled). *l.* pinnate, with a very ornamental plume-like appearance; pinnæ long, broad, drooping; petioles with the spines arranged verticillately. Malacca. This beautiful species is extremely rare.

C. viminalis (twiggy).* *l.* 1ft. to 2ft. long, pinnate; pinnæ about 6in. long, narrow, light green; petioles sheathing, densely armed with long flat white spines. When only 3ft. or 4ft. in height, its spiny whip-like spikes of flowers are often produced. Stem slender. *h.* 50ft. Java, 1847.

The following are other, but less-known, species: *australis*, *elegans*, *micranthus*, *niger*, *oblongus*, and *tenuis*.

CALAMUS AROMATICUS. An old name of **Acorus Calamus** (which *see*).

CALAMUS ODORATUS. An old name of **Andropogon Schœnanthus** (which *see*).

CALANDRINIA (in honour of L. Calandrini, an Italian botanist, who lived in the beginning of the eighteenth century). ORD. *Portulaceæ*. A rather large genus of fleshy, glabrous, annual or perennial, herbaceous plants, some fourteen or fifteen species growing in Australia, the rest occurring in the New World. Flowers usually rose or purple, solitary, or in terminal umbels or racemes. Leaves quite entire, radical or alternate. Only four or five species are cultivated in this country; these are treated as half-hardy annuals—with the exception of *C. umbellata*, which is best treated as a biennial—and as such they are extensively grown in small gardens, with most satisfactory results. They should be sown in the spots where they are intended to flower, as transplantation, unless performed

FIG. 315. CALANDRINIA MENZIESII, showing Flower and Habit.

with more than ordinary care, will considerably check their growth or result in loss. Their flowers only expand during bright sunshine, and, consequently, they are less grown than they otherwise would be. The plants thrive in

Calandrinia—*continued.*

a light sandy soil. *C. umbellata* may be sown in a pan, placed in a cold frame, in May or June; and when the plants are large enough to handle, they should be potted off, or placed out in colonies where they are to flower.

C. discolor (two-coloured). *fl.* bright rose, with a yellow tuft of stamens in the centre, 1½in. across; raceme long. July, August. *l.* fleshy, obovate, attenuated at the base, pale green above, purple beneath. *h.* 1ft. to 1½ft. Chili, 1834. (B. M. 3357.)

C. grandiflora (large-flowered).* *fl.* rosy, about 2in. across; calyx spotted; raceme simple, loose. Summer. *l.* fleshy, rhomboid, acute, petiolate. Stem suffruticose. *h.* 1ft. Chili, 1826. (B. R. 1194.)

C. Menziesii (Menzies').* *fl.* deep purple-crimson, from ½in. to 1in. across, terminal and axillary, solitary. June to September. *l.* elongated, spathulate, much attenuated at the base. Stems much branched, prostrate. California, 1831. SYN. *C. speciosa.* See Fig. 315. (B. R. 1598.)

C. nitida (shining). *fl.* rose-coloured, about 2in. across; raceme leafy, many-flowered. Summer. *l.* oblong-spathulate, sub-acute, glabrous, attenuated at the base, 1in. to 2in. in length. *h.* 6in. Chili, 1837. A very pretty hardy annual, forming a tuft from 4in. to 6in. across.

C. speciosa (showy). A synonym of *C. Menziesii.*

FIG. 316. CALANDRINIA UMBELLATA, showing Flower and Habit.

C. umbellata (umbellate).* *fl.* of a dazzling magenta-crimson, about as large as a sixpence; corymb cymose, terminal, many-flowered. Summer. *l.* radical, linear, acute, pilose. *h.* 6in. Peru, 1826. A very charming half-hardy biennial. See Fig. 316. (P. M. B. 12, 271.)

Other species occasionally met with are: *compressa, micrantha,* and *procumbens*; they are, however, inferior to those described above.

CALANTHE (from *kalos,* beautiful, and *anthos,* a flower). ORD. *Orchideæ.* SEC. *Vandæ.* A very handsome genus of stove terrestrial Orchids. They may be characterised as robust-growing plants, producing large, broad, many-ribbed, or plaited leaves, which are, with one or two exceptions, evergreen, and long spikes, bearing many flowers, distinguished by their calcarate lip, which is attached to the column, and by the eight thick, waxy pollen masses adhering to a separate gland. Calanthes should be special favourites with amateurs, as, in the first place, they produce an abundance of showy flowers, which last a long time in perfection; and, secondly, because they are so easily managed. In potting these plants, it will be necessary to depart from the usual style of potting Orchids, and, instead of elevating them above the rim of the pot upon a cone of peat and sphagnum, they must be kept below the rim, as in potting ordinary plants. In place of the usual soil and moss, these plants should have a mixture of loam, leaf mould, and peat, broken up rough, to which may be added some silver sand and dried cow manure. During the growing season, they require abundant supply of water, and in winter even this element must be administered freely to the evergreen kinds; whilst the deciduous ones, on the contrary, enjoy a thorough rest after

Calanthe—*continued.*

blooming. Good drainage is essential to all. Little more need be said upon the cultivation of Calanthes during the summer months. When growing, they enjoy strong heat and plenty of moisture; but, when growth is complete, a cooler situation is most beneficial. They are subject to the attacks of various insects, which must be continually searched for, and, when found, destroyed; for, if neglected in this particular, the bold and handsome leaves will be much disfigured, and rendered far from ornamental. Propagated by suckers and divisions. About forty species are known, of which the following are a selection:

C. curculigoides (Curculigo-like). *fl.* beautiful orange-yellow, disposed in an erect spike. Summer and autumn. *l.* large, evergreen, plaited. *h.* 2ft. Malacca, 1844. (B. R. 33, 8.)

C. Dominyi (Dominy's).* *fl.*, sepals and petals lilac; lip deep purple. This fine hybrid is a cross between *C. Masuca* and *C. veratrifolia.* (B. M. 5042.)

C. furcata (forked). *fl.* creamy white, very freely produced; spikes erect, 3ft. long. June to August. Luzon Isles, 1836. An excellent exhibition plant.

C. Masuca (Masuca).* *fl.*, sepals and petals deep violet colour, with an intense violet-purple lip; numerously produced on spikes 2ft. long. June to August. India, 1838. (B. M. 4541). The variety *grandiflora* differs from the type in its greater size both of spike and individual flower; the gigantic spikes are from 3ft. to 4ft. high, and continue blossoming for three months.

C. Petri (Peter Veitch's).* *fl.* whitish-yellow. Said to be very like *C. veratrifolia,* but bearing leaves a little narrower, and a system of five curious sulcate yellowish calli on the base of the lip, without the single lamella and teeth which are proper to that species. Polynesia, 1880.

C. pleiochroma (many-coloured). *fl.* whitish, purplish, ochre, orange. Japan, 1871.

C. Regnieri (Regnier's). *fl.*, sepals and petals white; lip rosy-pink; middle lobe short, wedge-shaped, and emarginate. Pseudo-bulbs jointed. Cochin China. *fausta* is a fine variety, with the base of the lip and column a warm crimson.

C. Sieboldii (Siebold's).* *fl.* yellow, large; spikes erect. *l.* broad, dark green, plaited. *h.* 1ft. Japan, 1837. An elegant evergreen dwarf-growing species. (R. H. 1855, 20.)

C. Textori (Textor's). *fl.* cream-white, washed with violet on the petals and column, as well as on the base of lip, where the calli are brick-red, changing later on to ochre-colour, excepting the white-lilac base of sepals and petals and the column; lip very narrow. Japan, 1877.

FIG. 317. SINGLE FLOWER OF CALANTHE VEITCHII.

C. Veitchii (Veitch's).* *fl.* rich bright rose, with a white throat; spikes often attaining a height of 3ft., and bearing an immense quantity of flowers. Winter. *l.* large, plaited, light green, deciduous. Pseudo-bulbs flask-shaped. This very beautiful hybrid is the result of a cross between *C. vestita* and *C. rosea* (Syn. *Limatodes rosea*). See Fig. 317. (B. M. 5375.)

C. veratrifolia (Veratrum-leaved).* *fl.* pure white, except the green tips of the sepals and the golden papillæ on the disk of the labellum; spikes 2ft. to 3ft. high, freely produced on well-grown plants. May to July. *l.* 2ft. or more long, dark green, broad, many-ribbed, with wavy margins. India, 1819. See Fig. 318. (B. M. 2615.)

Calanthe—*continued.*

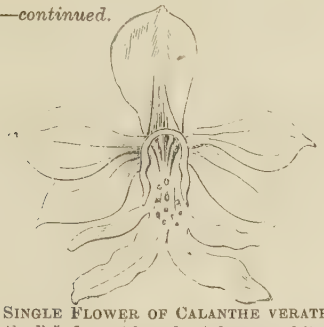


FIG. 318. SINGLE FLOWER OF CALANTHE VERATRIFOLIA.

C. vestita (clothed).* *fl.*, sepals and petals pure white, numerously produced in a many-flowered, nodding spike. *l.* deciduous. Pseudo-bulbs large, whitish, *h.* 2½ft. Burmah. (B. M. 4671.) The varieties of this species are very numerous.

C. v. igneo-oculata (fire-eyed).* *fl.*, base of the column purplish, over which is a dazzling fire-colour, the blotch in the base of the lip of the same colour. Borneo, 1876.

C. v. nivalis (snowy).* *fl.* pure white, entirely destitute of any colour on the lip. Java, 1868.

C. v. rubro-oculata (red-eyed).* *fl.* delicate white, with a blotch of rich crimson in the centre; upwards of 2in. across; spikes long, drooping, having a white downy covering, and rising from the base of the silvery-green pseudo-bulbs, when the latter are without leaves. October to February.

C. v. Turneri (Turner's).* *fl.* pure white, with rose-coloured eye, larger, and produced on longer flower-spikes than the other kinds; form of flowers more compact. Java. This is considered by some authorities, to be a distinct species.

CALATHEA (from *kalathos*, a basket; in reference to the basket-shaped stigma, or to the leaves being worked into baskets in South America). ORD. *Scitamineæ*. This genus of very ornamental-leaved stove plants is distinguished from *Maranta* by mere botanical characters; and the two genera are often confounded. Flowers in terminal spikes, bracteate; perianth six-cleft, outer segments lanceolate, inner ones blunt and irregular; stamens three, petal-like. Leaves large, springing from the contracted stem near the root. They delight in a rich, loose, open soil, consisting of peat, loam, and leaf soil, in about equal proportions, with the addition of a good sprinkling of sand, to keep it open and porous. The mixture should be used in a rough, lumpy state, so that the roots, which are of large size, may be able to travel with freedom. Nearly all the species admit of easy increase by division. July is a favourable time to set about it, or it may be carried out any time between that and the spring months. In order to make the necessary separation without damaging the roots, the plants should be shaken out from the soil, when they may be divided into as many pieces as there are separate crowns. Whether an increased stock be desired or not, Calatheas require fresh soil annually; and, if not reduced by division, they become much too thickly foliaged to properly develop, unless they are shifted into larger-sized pots, which can always be done if large specimens are required. When making divisions, see that each crown is well furnished with roots, so that they may at once commence sending up fresh young foliage. Although Calatheas require an abundant supply of water while growing, a stagnant moisture is most injurious; good drainage is, therefore, essential. To have the leaves in fine, healthy condition, plenty of atmospheric moisture must be maintained during their growth; and, if syringing is resorted to for the purpose of securing this, clear soft water should be used, or an unsightly deposit will be the result, by which the beauty of the plants, unless they are frequently sponged, will be spoiled. These plants require, in addition to plenty of moisture, moderate shade during the summer, as they dislike strong sunshine, and may, therefore, be grown among ferns, under creepers, in situations that would be of little use for other purposes. Calatheas are not subject to insects if properly supplied with water while growing, and a sufficiently moist atmosphere is at all times maintained; but, if either of these are lacking, red spider soon put in an appearance, and quickly disfigure the leaves.

Calathea—*continued.*

C. applicata (inclined). *fl.* white. Brazil, 1875. SYN. *Maranta pinnato-picta*. (B. H. 1875, 18.)

C. arrecta (erect).* *l.* rich satin-green on the upper side, and heavy ruby colour on the under side. Ecuador, 1872. A fine species, with a very elegant growth. (I. H. 1871, 77.)

C. Bachemiana (Bachem's). *l.* silvery, with green lines and blotches. Brazil, 1875.

C. Baraquinii (Baraquin's).* *l.* ovate-lanceolate; ground colour bright green, relieved by beautiful bands of silvery white. Amazons, 1868.

C. bella (handsome).* *l.* greyish-green, with the margins and two series of central patches deep green. Brazil, 1875. SYN. *Maranta tessellata Kegeljani*.

C. crocata (saffron-coloured). *fl.* orange. Brazil, 1875.

C. eximia (choice). 1857. SYN. *Phrynium eximium*. (R. G. 686.)

C. fasciata (banded).* *l.* 8in. to 12in. long, 6in. to 8in. wide, broadly cordate; ground colour bright green, with broad bands of white running across from midrib to the margin; the under side pale green, tinged with purple. *h.* 1ft. Brazil, 1859 (R. G. 255.)

C. hieroglyphica (hieroglyphic). *l.* broadly obovate, obtuse; ground colour rich dark velvety green, which, towards the midrib, shades off into light emerald green; primary veins oblique, and the spaces between them ornamented with irregular streaks and bars of silvery white; under surface of a uniform dark vinous purple. Columbia, 1873. Dwarf and distinct. (I. H. 1873, 122.)

C. illustris (bright).* *l.* somewhat obovate; upper surface of a bright pea-green, streaked with transverse bands of a deeper green; midrib pink, with two irregular blotches of white traversing the leaves from base to point, midway between the margin and costa; under surface deep purple. Ecuador, 1866.

C. Kerchoviana (Kerchove's).* *l.* cordate, oblong, obtuse, shortly and abruptly acuminate, greyish-green, with a row of purplish blotches on each side of the midrib. *h.* 6in. Brazil, 1879. SYN. *Maranta leuconeura Kerchoviana*.

C. Legrelliana (Le Grell's). *l.* very dark green, relieved by a feathery band of white, extending the whole length between the midrib and margin. Ecuador, 1867.

C. Leitzei (Leitze's). *l.* oblong-lanceolate, deep metallic green, and shining on the upper surface, with feather-like markings of deeper colour, purplish-violet beneath. Brazil, 1875. (R. G. 935.)

C. leopardina (leopard).* *l.* oblong, pale or yellowish-green, marked on each side of the costa with several oblong acuminate blotches of deep green. *h.* 2ft. Brazil, 1875. (R. G. 893.)

C. leuconeura (white-nerved). A synonym of *Maranta leuconeura*.

C. leucostachys (white-spiked). *h.* 1ft. A fine species, allied to *C. Warscewiczii*. Costa Rica, 1874. (B. M. 6205.)

C. Lindeni (Linden's).* *l.* oblong, 6in. to 12in. long, deep green, with blotches of yellowish-green on each side of the midrib; under surface purplish-rose, through which the markings of the upper side are visible. Peru, 1866. Very handsome and free-growing. (I. H. 1871, 82.)

C. Luciani (Lucian's). *l.* shining green, the midrib festooned with silvery white. Tropical America, 1872.

C. Makoyana (Makoy's).* *l.* oblong, somewhat unequal-sided, 6in. to 8in. long, upwards of 4in. broad; outer margin deep green, the central portion semi-transparent, beautifully blotched with creamy-yellow and white; the central part is also ornamented between the transverse veins with oblong blotches of deep green; petioles slender, purplish-red. Tropical America, 1872. SYN. *C. olivaris*. (G. C. 1872, p. 1589.)

C. Massangeana (Massange's).* *l.* beautifully covered with rich marking, presenting a somewhat similar appearance to the wings of certain butterflies. The outer portion is olive-green; the middle, on both sides of the costa, of a delicate silvery-grey colour, from which the whitish side veins run out in a well-defined and regular manner; the portion of the leaf surrounding the silvery centre is ornamented with large blotches of dark velvety purplish-maroon, occasionally shaded with brownish-crimson; the whole of the leaf being marked with silky and sparkling reflections. Brazil, 1875. It is of neat habit, growing in close tufts, its ample foliage covering the ground.

C. medio-picta (middle painted). *l.* oblong-acute, tapering to the base, dark green, with a feathered white central stripe. Brazil, 1878.

C. micans (glittering).* *l.* oblong-acuminate, 2in. to 3in. long, a little over 1in. in breadth, dark shining green, with a white feathery stripe down the centre. Tropical America. The smallest species of the genus, with a spreading habit, and quickly forming dense and beautiful tufts. There is a variety of this named *amabilis*. Brazil.

C. nitens (shining).* *l.* oblong, green, with a bright glossy surface, marked on each side of the midrib with a series of oblong acute

Calathea—*continued.*

bars, alternating with numerous lines of a dark green on a pale bright green ground. Brazil, 1880. An elegant and small-growing plant.

C. olivaris (olive-green). Synonymous with *C. Makoyana.*

C. ornata (ornamented).* *l.* oblong acuminate, 6in. to 9in. long, 3in. or more broad, yellowish-green, relieved by broad transverse bands of dark olive-green; under side tinged with purple. *h.* 1ft. to 2ft. Columbia, 1849.

C. o. albo-lineata (white-lined). Columbia, 1848. SYN. *Maranta albo-lineata.*

C. o. majestica (majestic). Rio Purus, 1866. SYN. *Maranta majestica.*

C. o. regalis (royal). Peru, 1856. SYNS. *Maranta regalis* and *M. corifolia.*

C. o. roseo-lineata (rosy-lined).* *h.* 1ft. 1848. SYN. *Maranta roseo-lineata.*

C. pacifica (Pacific). *l.* oblong ovate, of a fine dark green on the upper surface, olive-brown beneath. Eastern Peru, 1871.

FIG. 319. CALATHEA VEITCHII.

C. pardina (leopard).* *fl.* yellow, large, handsome, produced in great abundance. *l.* 10in. to 18in. long, 5in. to 6in. wide, ovate, pale green, with dark brown blotches on each side the midrib, and which occur at regular intervals the whole length of the leaf. New Grenada. (F. d. S. ii., 1101.)

C. prasina (leek-green). *l.* with a yellow-green central band. Brazil, 1875.

C. princeps (magnificent).* *l.* 12in. to 18in. long; centre rich dark green, broadly margined with yellowish-green, purple beneath. *h.* 2ft. to 3ft. Peru, 1869. A superb large-growing species.

C. pulchella (pretty). *l.* bright green, with two series of deep green blotches, alternately large and small. Brazil, 1859. This much resembles *C. zebrina* in general appearance, but is not so strong a grower, and the leaves are not so dark.

C. rosea-picta (rose-coloured). *l.* somewhat orbicular, of a rich glossy green; midrib of a lovely rose-colour, between the margin and midrib are two irregular bands of the same colour, traversing the entire length of the leaf. Upper Amazon, 1865. (R. G. 610.)

C. Seemanni (Seemann's). *l.* about 1ft. long, 6in. broad, satiny emerald-green; midrib whitish. Nicaragua, 1872.

C. splendida (splendid). *l.* large, oblong-lanceolate, deflexed, 10in. to 18in. long, rich dark olive-green, with distinct blotches of greenish-yellow. Brazil, 1864.

C. tubispatha (tube-spathed).* *l.* somewhat obovate, obtuse, 6in. to 12in. long, pale greenish-yellow, beautifully relieved by a row of rich brown oblong blotches, set in pairs on each side of the midrib, throughout the entire length of the leaf. West Tropical America, 1865. An elegant species. (B. M. 5542.)

Calathea—*continued.*

C. Vanden Heckei (Van den Heck's).* *l.* rich dark glossy green, shaded with transverse bands of a lighter green; midrib broadly margined with silvery-white, two bands of the same colour traverse the leaf from base to apex, midway between midrib and margin; under side of a uniform purplish-crimson. Brazil, 1865. Very distinct and handsome.

C. Veitchii (Veitch's).* *l.* large, ovate elliptic, over 1ft. long, very rich glossy green, marked along each side the midrib with crescent-shaped blotches of yellow, softened by shades of green and white; under surface light purple. *h.* 3ft. W. Tropical America, 1865. Probably the handsomest of the genus. See Fig. 319.

C. virginalis (virginal). *l.* large, broadly ovate, light green; midrib white, also with a white band on each side; the under side of a greyish-green. Amazons, 1857. Habit dwarf and compact.

C. vittata (striped). *l.* ovate-acuminate, 9in. long, very light green, with narrow transverse bars of white on each side of the midrib. Brazil, 1857.

C. Wallisii (Wallis's).* *l.* rather large, of a rich and pleasing light green, beautifully relieved with a ray of rich dark green. South America, 1867. A handsome and distinct sort, but somewhat rare.

C. W. discolor (two-coloured). *l.* bright velvety green, with the centre and margins grey. South America, 1871.

C. Warscewiczii (Warscewicz's).* *l.* 2ft. long, about 8in. wide, deep velvety green in colour, relieved by a feathery stripe of yellowish-green on either side the midrib, and extending from the base to the apex. *h.* 3ft. Tropical America, 1879. A fine sort. (R. G. 515.)

C. Wioti (Wiot's). *l.* bright green, with two series of olive-green blotches. Brazil, 1875.

FIG. 320. CALATHEA ZEBRINA.

C. zebrina.* Zebra Plant. *l.* 2ft. to 3ft. long, 6in. to 8in. wide, beautiful velvety light green on the upper side, barred with greenish purple; under side of a dull greenish purple. *h.* 2ft. Brazil, 1815. This is a very old inhabitant of our stoves, and, for general usefulness is not much surpassed. See Fig. 320. (B. R. 385.)

CALATHIAN VIOLET. *See* **Gentiana Pneumonanthe.**

CALCARATE. Spurred, or having a spur.

CALCEOLARIA (from *calceolus*, a little slipper, in allusion to the form of the corolla; the form *calceolarius*, shoemaker, probably chosen to include a reference to F. Calceolari, an Italian botanist of the sixteenth century). Slipperwort. ORD. *Scrophularineæ.* A genus of hardy or half-hardy shrubs, sub-shrubs or herbs. Peduncles one or many-flowered, axillary or terminal, corymbose; corolla with a very short tube; limb bilabiate; upper lip short, truncately rounded, entire; lower lip large, concave, slipper-shaped. Leaves opposite, sometimes three in a whorl, rarely alternate.

SHRUBBY SECTION. In addition to the widely-known utility of this class for bedding purposes, they are fine decorative plants when well grown, and useful alike in conservatory or dwelling house. It will be found more convenient to grow these in a pit or frame, as in such places they are less liable to the attacks of fly, and make sturdier growth. If large plants are required, cuttings should be taken in August, placed in a cold frame facing

Calceolaria—*continued.*

the north, in sandy soil, and, when rooted, potted off into 3in. pots. They should then be placed in a light sunny frame, where they may remain until the middle of February. The points should then be pinched out. When the plants break, they must be shifted into 48-sized pots. If there are from four to six breaks to each plant, it will be sufficient; but, should such not be the case, the plants must be stopped again, when the requisite number will probably be obtained. Directly the roots touch the pots, the plants should be transferred to 7in. or 8in. pots, in which they will flower, and the shoots must be tied out so as to develop fully. Every effort should be exerted to keep the foliage green to the base of the plants, and they should be fumigated on the first appearance of green fly. As the flower-spikes are thrown up, weak liquid manure, applied two or three times a week, will prove beneficial. For potting, the following compost is most suitable: One-half good fibrous loam, one-eighth thoroughly rotted manure, and the remainder leaf soil, with enough sharp sand to keep the whole open. During frosty weather, of course, it will be necessary to protect the frames with mats, and to water judiciously, to avoid damping. Those

FIG. 321. HERBACEOUS CALCEOLARIA.

plants intended for bedding will not require to be repotted, but should be inserted, about 3in. apart, in sandy soil, in a cold frame. The tops must be taken off early in March; and from the middle of April to the middle of May, they may be planted out where they are to remain. Should frosty weather, accompanied by drying winds, ensue, the plants will require the protection of inverted flower-pots, with pieces of slate or crock placed over the holes. A good soil, abundantly enriched with rotten manure, is most desirable for them.

Varieties. These are very numerous. The best of them are the following: BIJOU, dark red, very free; GAINE'S YELLOW, rich deep yellow, extremely free; GENERAL HAVELOCK, crimson-scarlet, very fine; GOLDEN GEM, bright yellow, perhaps the best; SPARKLER, crimson-gold, dwarf; VICTORIA, dark maroon, very attractive.

HERBACEOUS SECTION. These, like the preceding, are very useful, both for house and conservatory decoration (see Fig. 321). A packet of seed from a first-class firm will,

Calceolaria—*continued.*

if properly managed, produce a good percentage of excellent flowers. The seed may be sown from June to August, when large batches are required (when only one sowing is made, July will be the best month), on pans of light, sandy soil, which should be soaked with water before sowing. Care must be taken to make the surface of the soil level, and also to sow the seed as evenly as possible. It is better not to cover with soil, but a sheet of glass should be laid over the pan, which must be placed in a shady part of the greenhouse or cold frame until the young plants show the first leaf. The glass can then be gradually removed. When large enough to handle, the seedlings must be pricked out, about 2in. asunder, in pans or boxes, and placed in a close, shaded situation. As soon as of sufficient size, they must be placed singly in 3in. pots, returned to the frame, kept close for a few days, and as near the glass as possible, to make them sturdy. When necessary, they should be shifted into 5in. pots, in which they may be kept through the winter; or the later batches may be placed in small pots. By the end of October or early in November, the plants will be strong and fit for wintering; at this stage, the best place for them is in a dry, frost-proof pit, or on an airy shelf of the greenhouse, giving them sufficient water to prevent flagging. All dead leaves must be removed. On the first appearance of green fly, the plants should be fumigated with tobacco. From the end of January onwards, in order to encourage growth, the plants should be removed into 7in. or 8in. pots, giving plenty of drainage, and a compost consisting of one-half good light fibrous loam, one-fourth thoroughly decayed sheep manure, and one-fourth leaf soil, to which must be added sufficient coarse sand to keep the whole open. After potting, the plants must be again placed in the same position, and, as they require it, plenty of room given. Careful attention to watering is necessary, as they must not be allowed to get dry. Air must be given on all suitable occasions. The flower-stems, as they require it, should be supported with small neat sticks. About May, the plants will commence to bloom, and continue to do so for a couple of months. The best flowers should be selected, and cross-fertilised with a camel-hair pencil, in order to produce a good strain of seed for future sowing. The attention of horticulturists appears to be almost wholly confined to the innumerable hybrids raised from *amplexicaulis*, *arachnoidea*, *corymbosa*, *integrifolia*, *purpurea*, *thyrsiflora*, and a few others. Very few pure species are seen in cultivation, although most of them are well worth growing.

C. alba (white). *fl.* white; peduncles elongated, racemose, dichotomous. June. *l.* linear, remotely serrated. Plant suffruticose, clammy, and resinous. *h.* 1ft. Chili, 1844. Shrubby. (B. M. 4157.)

C. amplexicaulis (stem-clasping).* *fl.* yellow, umbellately fascicled; corymbs terminal; pedicels pilose. *l.* stem-clasping, ovate-oblong, acuminated, cordate, crenately-serrated, pilose. *h.* 1½ft. Peru, 1845. Half-hardy, herbaceous. (B. M. 4300.)

C. arachnoidea (cobwebby).* *fl.* purple; peduncles terminal, twin, elongated, dichotomous. June to September. *l.* lingulately-oblong, a little toothed, narrowing downwards into long winged petioles, which are connate at the base; about 5in. long, wrinkled. Stem herbaceous, branched, spreading, clothed with white cobwebbed wool, as well as the leaves and other parts, except the corolla. *h.* 1ft. Chili, 1827. (B. M. 2874.)

C. bicolor (two-coloured).* *fl.* in large terminal cymes; upper lip yellow, small; lower lip large, gaping, conchiform, the front clear yellow, the back white. July to November. *l.* broadly-ovate, sub-acute, coarsely crenated, wrinkled. *h.* 2ft. to 3ft. Stem much branched, woody at the base. Peru, 1829. SYN. *C. diffusa.* (B. R. 1374.)

C. Burbidgei (Burbidge's).* *fl.* rich yellow, with large lower lip. Autumn and winter. *l.* ovate, distinctly obtusely biserrate, sub-acute, with a narrow wing running down the petiole; both surfaces downy. *h.* 2ft. to 4ft. This is a handsome hybrid between *C. Pavonii* and *C. fuchsiæfolia*, raised by F. W. Burbidge, Esq., Trinity College Botanic Gardens, Dublin, 1882.

C. chelidonioides (Chelidonium-like). *fl.* yellow. June. *h.* 1ft. Peru, 1852. Annual.

C. corymbosa (corymbose). *fl.* yellow, marked with purple dots and lines, corymbose. May to October. *l.*, radical ones ovate

Calceolaria—*continued.*

and cordate, petiolate, doubly crenated, white beneath; cauline ones few, cordate, half amplexicaul. Stems herbaceous, leafless at bottom, but dichotomous and leafy at top. Plant hairy. *h.* 1ft. to 1½ft. Chili, 1822. (B. R. 723.)

C. deflexa (bending). Synonymous with *C. fuchsiæfolia.*

C. diffusa (spreading). A synonym of *C. bicolor.*

C. flexuosa (flexuose). *fl.*, corolla yellow; lower lip large, ventricose; peduncles axillary and terminal, many-flowered; pedicels umbellate. *l.* cordate, unequally and bluntly crenated, petiolate, remote. Plant shrubby, rough, beset with glandular hairs. *h.* 3ft. Peru, 1847. (B. M. 5154.)

C. Fothergillii (Fothergill's).* *fl.*, upper lip of corolla yellowish; lower lip sulphur colour, having the margins spotted with red, four times the size of the upper one; peduncles scape-formed, one-flowered. May to August. *l.* spathulate, quite entire, pilose above, about 1in. long. Stem herbaceous, a little divided near the root. *h.* 3in. to 6in. Falkland Islands, 1777. (B. M. 348.)

FIG. 322. CALCEOLARIA VIOLACEA.

C. fuchsiæfolia (Fuchsia-leaved).* *fl.* yellow, disposed in terminal panicles; upper lip nearly as large as the lower one. Spring. *l.* lanceolate, glandless. *h.* 1ft. to 2ft. Peru, 1878. This is a very handsome winter-flowering shrubby species, but it is difficult to keep the foliage in anything like good condition. SYN. *C. deflexa.* (Garden, March, 1879.)

C. Henrici (Anderson-Henry's). *fl.* yellow, disposed in terminal corymbose cymes; both lips of corolla much inflated, so as to entirely close the mouth. *l.* rather large, elongate-lanceolate, downy beneath. *h.* 2ft. Andes of Cuenca, 1865. Shrubby evergreen. (B. M. 5772.)

C. hyssopifolia (Hyssop-leaved).* *fl.* in terminal cymes; upper lip clear yellow, about half the width of the lower, and meeting closely to it; lower lip clear canary-yellow above, nearly white beneath. May to August. *l.* sessile, linear-lanceolate, sub-acute, entire. *h.* 1ft. to 2ft. Chili. Shrubby. (B. M. 5548.)

C. integrifolia (entire-leaved). Synonymous with *C. rugosa.*

C. lobata (lobed). *fl.* yellow, disposed in erect, loosely-branched cymes; lip curiously folded on itself, and spotted on the inner surface. *l.* palmately lobed. *h.* 9in. Peru, 1877. Herbaceous species. (B. M. 6330.)

C. Pavonii (Pavon's).* *fl.* rich yellow and brown, in large terminal clusters; upper lip small; lower lip large, widely gaping. *l.* perfoliate, the petioles connected by a broad wing, running all their length; blade broadly ovate, coarsely serrate-dentate; both sides covered with soft down. *h.* 2ft. to 4ft. Herbaceous. (B. M. 4525.)

Calceolaria—*continued.*

C. pinnata (pinnate). *fl.* sulphur-coloured; peduncles twin or tern, panicled. July to September. *l.* pinnate; leaflets or segments toothed, lower ones pinnatifidly toothed. *h.* 2ft. to 3ft. Peru, 1773. Annual, clothed with clammy hairs. (B. M. 41.)

C. pisacomensis (Pisacomanese). *fl.* rich orange-red, large; lower lip of corolla so bent upwards as to close the mouth; cymes produced from all the upper axils, forming long leafy panicles. *l.* ovate, obtuse, coarsely crenate. *h.* 3ft. Peru, 1868. A sub-shrubby perennial, of strong, erect habit.

C. plantaginea (Plantain-like).* *fl.* yellow; lower lip of corolla large, hemispherical; upper one small, bifid; scapes generally two to three-flowered, pilose. August. *l.* radical, ovate, rhomboid, rosulate, serrated. Plant herbaceous, stemless, pubescent. *h.* 1ft. Chili, 1826. (B. M. 2805.)

C. purpurea (purple). *fl.*, corolla of an uniform reddish-violet, rather small; corymbs terminal, many-flowered. July to September. *l.* wrinkled, hispid; radical ones cuneate-spathulate, serrated, quite entire behind, petiolate, acutish; cauline ones cordate, decussate, with a few long scattered hairs on their surfaces. Stems herbaceous, many from the same root. *h.* 1ft. Chili, 1826. There are several hybrids between this and other species. (B. M. 2775.)

C. rugosa (wrinkled). *fl.* yellow; panicles terminal, corymbose, pedunculate. August. *l.* ovate-lanceolate, or lanceolate, denticulated, wrinkled, opaque, rusty beneath; petioles winged, connate. *h.* 1ft. to 1½ft. Chili, 1822. Shrubby species. SYN. *C. integrifolia.* (B. R. 744.) Two varieties of this are *angustifolia*, and *viscosissima.*

C. scabiosæfolia (Scabious-leaved).* *fl.*, corolla pale yellow; lower lip large, ventricose; peduncles terminal, corymbose. May to October. *l.*, lower ones pinnate; superior ones pinnatifid, three-lobed, or simple, the terminal segment always the largest. Plant rather hairy. Peru, 1822. Evergreen trailer. (B. M. 2405.)

C. tenella (small). *fl.* golden yellow, with orange-red spots within the lower lip; corymbs few-flowered. *l.* opposite, ovate, acuminated. *h.* 6in. Chili, 1873. Hardy, herbaceous. (B. M. 6231.)

C. thyrsiflora (thyrse-flowered). *fl.* yellow, downy inside; thyrse terminal, crowded; peduncles compound, umbellate. June. *l.* linear, attenuated at both ends, serrate-toothed, sessile, 2in. long, and two lines broad. *h.* 1ft. to 2ft. Chili, 1827. Shrubby, clammy. (B. M. 2915.)

C. violacea (violet).* *fl.*, corolla pale violet, spotted with deeper violet beneath; lip spreading in a campanulate manner; peduncles terminal by threes, corymbose; pedicels one to two-flowered. June. *l.* petiolate, ovate-lanceolate, coarsely serrated, white beneath. *h.* 2ft. Chili, 1853. Shrubby. (B. M. 4929.) See Fig. 322.

CALCEOLATE. Shaped like a slipper or round-toed shoe.

CALDCLUVIA (named after Alexander Caldcleugh, F.R.S. and F.L.S., who collected and sent to this country many plants from Chili). ORD. *Saxifrageæ.* A greenhouse evergreen tree. Flowers disposed in terminal panicles. Leaves opposite, simple, serrate, glabrous; pedicels jointless; stipules twin, sub-falcate, toothed, caducous. *C. paniculata* thrives well in a mixture composed of peat and loam. Propagation may be effected by cuttings of the half-ripened shoots, which should be planted in sand, under a hand glass, and placed in a very gentle bottom heat.

C. paniculata (panicled). *fl.* white. June. Chili, 1831.

CALEA (from *kalos*, beautiful; referring to the flowers). ORD. *Compositæ.* A genus of stove evergreen herbs or small shrubs. Pappus hairy; receptacle paleaceous; involucre imbricated. They thrive in a compost of peat and loam. Side shoots root readily, if placed in sand, under glass, and with bottom heat; seeds may be sown in March. Warmer parts of New World.

CALEANA (named after G. Caley, Superintendent of the Botanical Garden, St. Vincent). ORD. *Orchideæ.* A genus of greenhouse terrestrial Orchids, natives of Australia. Flowers few, greenish-brown; column broad, thin, concave; sepals and petals narrow, reflexed; lip posticous, peltate, unguiculate, highly irritable. In fine weather, or if left undisturbed, this lip bends back, leaving the column uncovered; but in wet weather, or if the plant is shaken, the lip falls over the column, securely fastening it. Leaves solitary, radical. They are of easy culture, in a compost of fibry peat, lumpy loam, and a little charcoal.

B. major (greater). *fl.* green-brown. June. 1810.

Caleana—*continued.*

C. minor (less). *fl.* green-brown. June. 1822.
C. nigrita (blackish-flowered). *fl.* dark.

CALECTASIA (from *kalos*, beautiful, and *ektasis*, extension; in allusion to the star-like perianth segments). ORD. *Juncaceæ*. An elegant greenhouse suffruticose perennial, with dry, permanent, starry flowers. It thrives best in a compost of peat and loam. Propagated by divisions.

C. cyanea (blue). *fl.* bright blue, solitary, on short terminal branches. June. *l.* needle-shaped, sheathing at the base. Australia, 1840. (B. M. 3834.)

CALENDULA (from *calendæ*, the first day of the month; in allusion to the almost perpetual flowering). Marigold. ORD. *Compositæ*. A genus of showy greenhouse and hardy annuals, and some few greenhouse shrubby species. Pappus none; receptacle naked; involucre of one or two series of sub-equal, acuminate, generally scarious-edged bracts. The shrubby species are propagated by cuttings, and thrive best in a compost of loam and peat. For culture of the annuals, *see* **Marigold.**

FIG. 323. FLOWERS OF CALENDULA OFFICINALIS.

C. arvensis (field). *fl.-heads* yellow. Pericarps urceolate, obovate, smooth; outer lanceolate-subulate, muricated at back. *h.* 2ft. Europe, 1597. Hardy annual.

C. maderensis (Madeira).* *fl.-heads* orange. Pericarps cymbiform. incurved, muricated; outer five ovate-lanceolate, membranous, toothed at edge. *h.* 2ft. Madeira, 1795. Hardy. SYN. *C. stellata.*

C. officinalis (officinal).* Common Marigold. *fl.-heads* orange. June to September. Pericarps cymbiform, all incurved, muricated. *h.* 3ft. South Europe, 1573. Hardy annual. See Fig. 323.

C. o. prolifera (proliferous). A garden form, analogous to the Hen and Chickens Daisy. See Fig. 324.

C. stellata (stellate). A synonym of *C. maderensis.*

FIG. 324. FLOWER OF CALENDULA OFFICINALIS PROLIFERA.

CALICO BUSH. *See* **Kalmia latifolia.**

CALIFORNIAN EVERGREEN REDWOOD. *See* **Sequoia sempervirens.**

CALIFORNIAN MAYBUSH. *See* **Photinia arbutifolia.**

CALIFORNIAN PEPPER-TREE. *See* **Schinus Molle.**

CALIFORNIAN POPPY. *See* **Platystemon californicus.**

CALIPHRURIA (from *kalos*, beautiful, and *phroura*, prison; from the handsome spathe inclosing the flowers). ORD. *Amaryllideæ*. Pretty half-hardy greenhouse bulbs. Tube of perianth narrow, funnel-shaped, nearly straight; limb regular, stellate; stamens furnished with a bristle on each side. They thrive best in a compost of sandy loam, a little peat, leaf soil, and sand. Propagated by offsets. After flowering, the plants should have a slight heat; and, when starting into new growth, should be repotted.

C. Hartwegiana (Hartweg's).* *fl.* greenish-white; umbels seven-flowered; scape nearly terete, glaucous. May. *l.* petiolate, depressed, ovate, sub-plicate, green. *h.* 1ft. New Grenada, 1843. (B. M. 6259.)

FIG. 325. CALIPHRURIA SUBEDENTATA.

C. subedentata (rarely-toothed).* *fl.* white, funnel-shaped, disposed in a truss, on a long scape. Winter. *l.* stalked, ovate-oblong. *h.* 1½ft. Columbia, 1876. See Fig. 325. (B. M. 6289.)

CALISAYA BARK. *See* **Cinchona Calisaya.**

CALLA (from *kallos*, beauty). SYN. *Provenzalia.* ORD. *Aroideæ* (*Araceæ*). A monotypic genus. The species is a native of Central and Northern Europe and North

FIG. 326. CALLA PALUSTRIS, showing Habit and detached Inflorescence.

Calla—*continued.*

America, has creeping or floating stems, and cordate entire leaves. *C. palustris* is sometimes grown in collections of aquatics or bog plants; and, although, perhaps, hardly worth cultivating as a pot plant, is well worth a place in open ornamental waters. *Richardia africana* is frequently erroneously called *Calla æthiopica.*

C. palustris (marsh). *fl.*, spadix protected by a flat white spathe, upper ones female, lower hermaphrodite, with numerous thread-like stamens. *l.* stalked, emerging from a sheath. *h.* 6in. Hardy aquatic, naturalised here and there in Britain. See Fig. 326.

CALLI. Small callosities, or little protuberances.

CALLIANDRA (from *kallos*, beauty, and *andros*, a stamen; referring to the elegant long, silky, purple or white stamens). ORD. *Leguminosæ.* A genus of beautiful stove evergreen shrubs. Flowers usually borne on stalked globose heads; corollas small, hidden by the numerous filaments of the stamens. Leaves bipinnate; leaflets varying in size and number. They thrive in a compost of peat and loam. Propagated by cuttings of rather firm young wood, inserted in sand, under a hand glass, in heat.

C. Harrisii (Harris's). *fl.* pink; peduncles axillary, fascicled, glandularly downy. February. *l.* bipinnate; leaflets obovate, falcate, downy; stipules small, falcate. Branches puberulous. *h.* 10ft. Mexico, 1838. (B. M. 4238.)

C. Tweedieï (Tweedie's).* *fl.* red; peduncles longer than the petioles; bracts linear. March and April. *l.* with three or four pairs of pinnæ; leaflets numerous, oblong-linear, acutish, ciliated, pilose beneath; stipules ovate, acuminate. Branches and petioles pilose. *h.* 6ft. Brazil, 1840. (B. M. 4188.)

CALLICARPA (from *kallos*, beauty, and *karpos*, fruit; referring to the beautiful berries). SYN. *Porphyra.* ORD. *Verbenaceæ.* A genus of stove, greenhouse, or nearly hardy evergreen shrubs, closely allied to *Petræa.* Flowers inconspicuous, disposed in axillary cymes; corolla-tube short, with the limb four-lobed. Fruit a very ornamental small juicy berry or drupe. The following mode of culture has been recommended: "After the old plants have been cut back in the spring, and started into growth, the young shoots will strike as readily as a Fuchsia, and with exactly the same treatment. In order to make good plants, short-jointed cuttings should be selected; and, as soon as these are struck, they should be potted into 2½in. pots, using a compost of equal parts loam and peat, with a little charcoal and river sand. When they commence to grow, after being potted, remove to a pit or house with a temperature ranging from 60deg. to 75deg. Pinch out the tops of the plants as soon as they have three pairs of leaves, and whenever each of the laterals has made two pairs of leaves, pinch out their points, and continue this operation with all the rest of the shoots till the beginning of August, at the same time keeping off all the flower-buds. The next shift will be into 4in. or 5in. pots. They should always have plenty of light and air, but more especially after they come into flower."

C. americana (American). *fl.* red, small, in axillary cymes. Berries violet-coloured. *l.* ovate-oblong, toothed, silvery beneath, with a scurf of tomentum. *h.* 6ft. South America, 1724. Greenhouse

C. japonica (Japanese). *fl.* pink. August. *l.* stalked, ovate, oblong, acuminate, serrate. *h.* 3ft. Japan, 1850. Stove. (L. & P. F. G. ii., p. 165.)

C. lanata (woolly). *fl.* purplish. June. Berries purple. *l.* sessile, ovate, acuminate, serrate, hairy beneath. *h.* 3ft. India, 1788. Stove. (S. F. d. J. 1861, p. 96.)

C. purpurea (purple). *fl.* insignificant, borne in cymose clusters, upon axillary footstalks. Berries very numerous, bright glossy deep violet coloured. *l.* opposite, ovate, acuminate; edges serrated; profusely clothed, as well as the stem, with hairs. *h.* 3ft. India, 1822. Stove (Garden, June, 1833.)

C. rubella (reddish). *fl.* red. May. *l.* sessile, obovate, acuminate, cordate at the base, hairy on both surfaces. *h.* 2ft. China, 1822. Half-hardy. (B. R. 883.)

CALLICHROA (from *kallos*, beauty, and *chroa*, colour; referring to the bright yellow colour of the flowers). ORD. *Compositæ.* This genus is now usually included under *Layia.* Hardy annual, of easy culture in common

Callichroa—*continued.*

garden soil. Seeds may be sown in March, on a slight hotbed, and transplanted to the open border early in May; or if sown out of doors in April, it will flower in the autumn.

C. platyglossa (broad-tongued). *fl.-heads* yellow, solitary, pedunculate; ray florets large, cuneate. Autumn. *l.* alternate, sessile, ciliated. *h.* 1ft. California, 1836. SYN. *Layia platyglossa.* (B. M. 3719.)

CALLICOMA (from *kallos*, beauty, and *kome*, hair; in reference to the tufted heads of flowers). ORD. *Saxifrageæ.* A greenhouse evergreen shrub. Flowers capitate; heads terminating the tops of the branchlets, pedunculate, globose. Leaves simple, coarsely serrated, stalked. Stipules membranous, bidentate, caducous. It thrives well in a sandy peat soil. Half ripened cuttings will root if placed in the same sort of soil, under a hand glass.

C. serratifolia (saw-leaved). Black Wattle. *fl.* yellow. May to August. *l.* lanceolate, acuminate, hoary beneath, attenuated at the base. *h.* 4ft. New South Wales, 1793. (B. M. 1811.)

CALLIGONUM (from *kallos*, beauty, and *gonu*, a knee-joint; in reference to its leafless joint). SYNS. *Pallasia, Pterococcus.* ORD. *Polygonaceæ.* A genus containing about a score species of very curious, erect, evergreen, hardy shrubs, found growing in dry, arid, sandy spots in Northern Africa and Western Asia. They will thrive in any well-drained sandy loam. Cuttings will root in spring or autumn if placed under a hand glass.

C. Pallasia (Pallas's). *fl.* whitish, in groups. May. *fr.* winged; wings membranous, curled and toothed, succulent, acid, edible. *l.* simple, alternate, exstipulate, deciduous, caducous, minute. Shoots rush-like, smooth, green. *h.* 3ft. to 4ft. Caspian Sea, 1780.

CALLIOPSIS. *See* **Coreopsis.**

CALLIPRORA (from *kallos*, beauty, and *prora*, a front; referring to the front view of the flower). ORD. *Liliaceæ.* A very pretty little bulbous plant, now often referred to *Brodiæa.* It thrives in a well-drained spot on the lower flanks of rockwork, in dry, rich, sandy soil. Propagated by offsets, which should remain on the parent bulbs until they are a good size.

C. lutea (yellow).* Pretty Face. *fl.*, segments purplish-brown in the middle on the outside. Summer. *l.* linear-lanceolate, acuminated, channelled, longer than the flower-stem; bracts sheathing, scarious, much shorter than the pedicels. *h.* 9in. North California, 1831. SYNS. *Brodiæa ixioides, Milla ixioides.* (B. M. 3588.)

CALLIPSYCHE (from *kallos*, beauty, and *psyche*, a butterfly; alluding to the handsome flowers). ORD. *Amaryllideæ.* Ornamental greenhouse bulbs; requiring shade, and a compost of rich sandy loam and leaf mould, with good drainage. Propagated by seeds and offsets. They should have plenty of water when growing, and, during the winter, be kept moderately dry, but not dried off, so as to cause them to shrivel. As the leaves wither, water should be gradually withheld.

C. aurantiaca (orange).* *fl.* deep golden-yellow, several in an umbel, spreading, much flattened sideways; stamens green, twice the length of the perianth; scape erect, nearly 2ft. high. *l.* few, oblong-acute, bright green, conspicuously veined, stalked, 6in. long. Andes of Ecuador, 1868. (Ref. B. 167.)

C. eucrosiodes (Eucrosia-like).* *fl.* scarlet and green; stamens very long, incurved; scape about ten-flowered, glaucous. March. *l.* few, green, tessellated, pitted, 4in. wide. *h.* 2ft. Mexico, 1843. (B. R. 1845, 45.)

C. mirabilis (wonderful).* *fl.* greenish-yellow, small, with stamens three times as long as the perianth, and spreading out on all sides; disposed in an umbellate head of about thirty blossoms; scape 3ft. high. *l.* about two, oblong-spathulate, green, 1ft. long. Peru, 1868. An extremely curious plant. (Ref. B. 168.)

CALLIPTERIS (from *kallos*, beauty, and *pteris*, a fern). ORD. *Filices.* A genus of stove ferns, founded upon the sub-genus *Diplazium*, which is now included under *Asplenium.*

CALLIRHOE (of mythological origin, from Callirhoe, a daughter of the river-god Achelous). Poppy-Mallow. Allied to *Malva.* Species belonging to this genus have been erroneously referred to *Malva* and *Nuttallia.* ORD.

Callirhoe—*continued.*

Malvaceæ. A genus of elegant annual or perennial herbs, natives of North America. They are of extremely easy cultivation, thriving in a compost of light, rich, sandy loam. Propagation of the perennial species may be effected by means of both seeds and cuttings; of the annuals, by seeds only. Seeds should be sown in spring, either outside, or in pans in a cold frame. Young cuttings should be taken and dibbled in sandy soil in a frame.

C. digitata (fingered).* *fl.* reddish-purple; peduncles long, axillary, one-flowered. Summer. *l.* sub-peltate, six to seven-parted, with linear-entire or two-parted segments; upper ones more simple. *h.* 2ft. to 3ft. 1824. Perennial. (S. B. F. G. 129, under the name of *Nuttallia digitata.*)

C. involucrata (involucrate).* *fl.* crimson, nearly 2in. across, loosely panicled. Summer. *l.* divided nearly to the base, three to five-parted; segments narrow, lanceolate, three to five-toothed, hairy on both surfaces. Habit procumbent; stems hairy. *h.* 6in. Perennial. (G. W. P. A. 26.) SYN. *Malva involucrata* (B. M. 4681).

C. Papaver (Poppy-like).* *fl.* violet-red; sepals ovate-acute, ciliated. Summer. *l.*, root leaves lobed or pedate; lower stem leaves palmato-pedate, upper digitate or simple. *h.* 3ft. Louisiana, 1833. Perennial. SYN. *Nuttallia Papaver.* (B. M. 3287.)

C. pedata (pedate-leaved). *fl.* cherry-red, panicled. August. *l.* laciniately-pedate; upper ones trifid. *h.* 2ft. to 3ft. 1824. Annual. (R. H. 1857, 148.)

C. triangulata (triangular-leaved). *fl.* pale purple. August. 1836. Perennial. SYN. *Nuttallia cordata* (under which name it is figured in B. R. 1938).

CALLISTACHYS. *See* **Oxylobium.**

CALLISTEMMA. *See* **Callistephus.**

CALLISTEMON (from *kallos*, beauty, and *stemon*, a stamen; in most of the species, the stamens are of a beautiful scarlet colour). ORD. *Myrtaceæ.* Handsome greenhouse evergreen shrubs or trees, having the inflorescence rising from the old branches in crowded spikes, as in the species of *Melaleuca*, but with the stamens free, as in *Metrosideros.* Leaves elongated, stiff, alternate, usually lanceolate. All the species of this genus are very ornamental and neat in habit. They are well adapted for a conservatory. The soil best suited for them is a mixture of loam, peat, and sand. Ripened cuttings strike root in sand, under a hand glass; seeds are frequently produced on large plants, and these may also be used to increase the stock, but they do not produce flowering plants for a considerable time; whereas plants raised from cuttings, taken from flowering plants, come into flower when small.

FIG. 327. CALLISTEMON SPECIOSUS.

C. linearis (linear-leaved).* *fl.* scarlet; calyces clothed with velvety pubescence. June. *l.* linear, stiff, acute, keeled beneath, channelled above, villous when young. *h.* 4ft. to 6ft. New South Wales, 1788.

C. lophanthus (crest-flowered). Synonymous with *C. salignus.*

C. salignus (willow). *fl.* straw-coloured, distinct, spicate, nearly terminal; petals rather pubescent, ciliated; calyx pilose. June to August. *l.* lanceolate, attenuated at both ends, mucronate, one-nerved, villous when young, as well as the branches. *h.* 4ft. to 6ft. Australia, 1806. SYN. *C. lophanthus.* (L. B. C. 1302.)

C. speciosus (showy).* *fl.* scarlet; calyx villous. March to July. *l.* lanceolate, mucronate, flat, middle nerve rather prominent; when young, rather silky from adpressed villi, and reddish. *h.* 5ft. to 10ft. West Australia, 1823. SYN. *Metrosideros speciosa.* See Fig. 327. (B. M. 1761.)

CALLISTEPHUS (from *kallistos*, most beautiful, and *stephos*, a crown; in allusion to the appendages on the ripe fruit). China Aster. SYN. *Callistemma.* ORD. *Compositæ.* A hardy annual, requiring an open situation and a rich loamy soil. Involucre of many fringed bracts; receptacle naked, pitted; pappus double. Propagated by seed, sown in a hotbed in March, the seedlings being hardened off and transplanted in May. For culture of these much grown plants and their varieties, *see* **Aster.**

Chrysanthemum-flowered Aster.

Truffaut's Pæony-flowered Aster.

Victoria Aster.

FIG. 328. FLOWER-HEADS OF CALLISTEPHUS CHINENSIS VARS.

C. chinensis (Chinese).* *fl-heads* dark purple. July. *l.* ovate, coarsely toothed, stalked; stem ones sessile, cuneate at the base. Stem hispid. Branches with single heads. *h.* 2ft. China, 1731. See Fig. 328.

CALLITRIS (probably altered from *kallistos*, most beautiful; referring to the whole plant). ORD. *Coniferæ.* SYN. *Frenela.* Half-hardy evergreen shrubs or small trees, with long, very slender-jointed branches, and often very minute, scale-like, persistent leaves. Flowers monœcious.

Callitris—*continued.*

Fruit globular, composed of four to six—rarely eight—unequal, woody, valvate scales, with one or two seeds at the base of each. All the species are somewhat tender, in England, except in the more southern districts. They require a sandy loam compost. Propagated by cuttings, inserted under a handlight in autumn, and protected by a cold pit; or by seeds. *See also* **Widdringtonia.**

C. quadrivalvis (four-valved). Arar-tree; Sandarach Gum-tree. *fl.*, female catkin tetragonal, with four oval valves, each furnished with a point, and two of which bear seeds. February to May. *l.* flattened, articulate. *h.* 15ft. to 20ft. Barbary, 1815.

CALLIXENE. *See* **Luzuriaga.**

Calluna—*continued.*

Serlii, and *Hammondi*), flesh-coloured (*carnea*), and double-flowered varieties (*fl.-pl.*) are all well worth growing in shrubberies; *aurea* and *argentea*, with gold and silver coloured shoots, are also very ornamental. The value of the common form can scarcely be over-estimated for planting on barren hill sides or spaces; it affords excellent shelter for game, and food for bees.

CALLUS. The new formation at the end of a cutting before it puts forth roots; when the Callus is formed, it shows that the cutting is in a healthy state.

CALOCHILUS (from *kalos*, beautiful, and *cheilos*, a lip; referring to the beauty of the labellum or lip). ORD. *Orchideæ*. Interesting greenhouse terrestrial tuberous-rooted Orchids, allied to *Epipactis*. Sepals yellowish-green;

FIG. 329. FLOWERS AND LEAVES OF CALOCHORTUS VENUSTUS.

CALLOSE. Callous, hardened.

CALLOUSLY-GLANDULAR. Having hardened glands.

CALLOUSLY-SERRATED. Having hardened serratures.

CALLUNA (from *kalluno*, to sweep, from the use of the plant in brooms). Common Ling; Heather. ORD. *Ericaceæ*. A small hardy spreading shrub, very common throughout Northern and Central Europe. Corolla campanulate, four-lobed, shorter than the calyx. For culture, *see* **Erica.**

C. vulgaris (common).* *fl.* disposed in long, terminal, spicate racemes. July to September. *l.* trigonal, obtuse, very short, imbricating in four rows, having the margins revolute and the base sagittate. *h.* 1ft. to 3ft. Britain. There are numerous very ornamental varieties of this species, which are admirably adapted for planting in borders and clumps. The white-flowered (*alba*,

lip purple, covered with rich brown hairs. For culture, *see* **Bletia.**

C. campestris (field). *fl.* greenish and brown. April to June. *l.* narrow, oblong, pointed. Stem leafy, slender, terete. *h.* 9in. Australia, 1824. (B. M. 3187.)

C. paludosus (marsh).* *fl.* very similar in colour to those of *C. campestris*, but rather larger. May and June. *l.* rather broader. *h.* 9in. Australia, 1823. (F. A. O., part 4.)

CALOCHORTUS (from *kalos*, beautiful, and *chortos*, grass; referring to the leaves). Mariposa Lily. ORD. *Liliaceæ*. Handsome bulbous plants. Flowers showy, on erect scapes; perianth deciduous; three outer segments sepaloid, three inner ones much larger and broader, and bearded on the inside. Leaves ensiform. Bulbs tunicated. These have not, hitherto, been generally grown in the open air with much success; but in warm

Calochortus—*continued.*

localities and sheltered positions, they may be flowered outside. A frame, in a sunny situation, is the best possible place for their cultivation. Here they may be fully exposed to the sun and air, during mild weather, through the winter; and, when expedient, they may be protected from excessive moisture, as that is the primary cause of failure, rather than cold, for they are perfectly hardy, and capable of enduring all the frost we are likely to get. From May onwards, the lights might be wholly removed. From the end of June to August, the bulbs will be in bloom, when, if necessary, the flowers should be fertilised to secure seed; and when the capsules are forming, material assistance would be given by placing the lights on again, allowing plenty of air. Assuming that fresh bulbs are being planted, they should be in the soil early in the autumn, as nothing is more prejudicial than keeping them dry through the winter. A good depth of soil should be provided, composed of fibrous loam, leaf soil, and sand, in equal proportions, in a well-drained position. The bulbs must be planted 3in. deep, and some sand placed about them; they may be left undisturbed for years. Of course, where no frame can be provided, they may be planted in a well-drained, sunny position in the same soil. They are also easily managed in pots, but it is necessary to pot in the autumn, and keep in a frame. Through the winter, they must never be allowed to get dry, until the leaves are withering in the autumn, when water may be withheld.

Propagation. This may be effected by seeds or offsets, and by the tiny bulbs frequently produced on the upper portion of the stem. Sow seeds in pans, in a cool house or frame, as soon as ripe, or in the early part of the year, and keep the plants close to the glass during their early stages, as they are very liable to damp off. Sow thinly, so as to enable the young plants to pass a second season in the seed pots or pans. Early in the third season, pot off and plant out singly, encouraging them to grow freely. Propagation by offsets is the most usual method. With liberal treatment, most of the species increase pretty freely. The offsets are best removed when the plants are in a dormant state. They may be either grown in pots or pans, or planted out in pits or frames, until they reach flowering size. During the season of rest, it is the safest plan, with those in pots, to keep them in the earth in which they were grown.

C. albus (white).* *fl.* snow-white, with a rich blotch, bearded and ciliated, large, globose, pendent; umbels many-flowered, on stems from 1ft. to 1½ft. high. California, 1832. This handsome species is rare. SYN. *Cyclobothra alba.* (B. R. 1661.)

C. Benthami (Bentham's).* *fl.* rich yellow; petals obtuse, densely covered with yellow hairs; stem three to six-flowered. July, August. *l.* linear, much elongated. *h.* 4in. to 8in. Sierra Nevada. SYN. *C. elegans lutea.*

C. cœruleus (bluish).* *fl.* lilac, more or less lined and dotted with dark blue, the petals covered and fringed with slender hairs; stem two to five-flowered. July. *l.* solitary, linear. *h.* 3in. to 6in. Sierra Nevada.

C. elegans (elegant).* *fl.* greenish-white, purplish at base; stems three-flowered; petals not ciliate on the margin, or sparingly so. June. *h.* 8in. California, 1826. This is a rare species.

C. e. lutea (yellow). A synonym of *C. Benthami.*

C. Gunnisoni (Gunnison's).* *fl.* light lilac, yellowish-green below the middle, with a purple band encircling the base of the perianth; large, 2in. to 3in. in diameter. Rocky Mountains.

C. Leichtlinii (Leichtlin's). A synonym of *C. Nuttallii.*

C. lilacinus (lilac).* *fl.* pale pink, hairy below the middle, 1½in. across, with three segments narrow and three broad; scape slender, leafy, bearing one to five flowers. *l.* solitary, narrow lanceolate, radical. *h.* 6in. to 8in. California, 1868. SYN. *C. umbellatus.* (B. M. 5804, under the name of *C. uniflorus.*)

C. luteus (yellow).* *fl.* terminal, two or three together; exterior segments of the perianth greenish; the inner yellow, bordered with purple hairs. September. *h.* 1ft. California, 1831. (B. R. 1567.)

C. l. oculatus (eyed). *fl.* very charming bright yellow, with a bold eye on the inside of each petal.

C. macrocarpus (large-capsuled). *fl.* very large, lavender-coloured, on stems 1ft. high. August. California, 1826. (B. R. 1152.)

Calochortus—*continued.*

C. Maweanus (Mawe's). *fl.*, sepals purplish, broadly obovate acute; petals white or bluish-purple, longer than the sepals, the surfaces more or less covered with long purplish hairs. June, July. *l.* glaucous, linear. Stem three to six-flowered. *h.* 6in. to 10in. San Francisco, &c. (B. M. 5976, figured under the name of *C. elegans.*)

C. Nuttallii (Nuttall's).* *fl.* large, 2½in. across; the three smaller segments of the perianth of a greenish colour streaked with red; the three larger segments pure white, with a purple spot at the base on the inner surface; two or three flowers on a stalk. June. *l.* linear, glaucous. *h.* 6in. California, 1869. SYN. *C. Leichtlinii.* (B. M. 5862).

C. pulchellus (beautiful).* *fl.* bright yellow, globular, drooping; umbels three to five-flowered, on stems from 10in. to 12in. high. Summer. California, 1832. A lovely species. (B. R. 1662.) SYN. *Cyclobothra pulchella.*

C. purpureus (purple).* *fl.*, outer segments of the perianth green and purple outside and yellow within; inner segments purple outside and yellow within. August. *h.* 3ft. Mexico, 1827. (S. B. F. G. ser. ii., 20.)

C. splendens (splendid).* *fl.* clear lilac, large. August. *h.* 1½ft. California, 1832. (B. R. 1676.)

C. umbellatus (umbelled). A synonym of *C. lilacinus.*

C. venustus (charming).* *fl.* large, white, nearly 3in. in diameter, yellow at the base, deeply stained with crimson, and blotched on each segment with crimson. *h.* 1½ft. California, 1836. See Fig. 329. (B. R. 1669.) There are three varieties of this species, viz., *brachysepalus* (short-sepaled), *lilacinus* (lilac), and *purpureus* (purple-flowered).

CALODENDRON (from *kalos*, beautiful, and *dendron*, a tree). ORD. *Rutaceæ.* A very handsome greenhouse evergreen tree. Flowers in terminal panicles. Leaves large, opposite, simple, crenated. It will grow freely in a mixture of loam and peat. Cuttings of half-ripened wood root in sand if placed under a bell glass, in gentle bottom heat.

C. capensis (Cape). *fl.* flesh-coloured; pedicels compressed, dilated under the flower; panicle trichotomously divided. Branches opposite, or three in a whorl. *h.* 40ft. Cape of Good Hope, 1789. This is supposed to be one of the finest trees at the Cape of Good Hope. (G. C., 1883, xix., 217.) See Fig. 330, for which we are indebted to Mr. Bull.

CALODRACON. *See* **Cordyline.**

CALONYCTION. *See* **Ipomœa.**

CALOPHACA (from *kalos*, beautiful, and *phake*, a lentil; in allusion to the beauty of the plant, and to its being one of the leguminous kind). ORD. *Leguminosæ.* A hardy deciduous shrub, with axillary pedunculate racemes of yellow flowers, and impari-pinnate leaves. This is well adapted for the front of shrubberies. It is somewhat difficult to propagate, except by seeds, which, however, in fine seasons, are produced in abundance. Grafted high on the common Laburnum, it forms an object at once singular, picturesque, and beautiful, whether covered with blossoms, or with its fine reddish pods.

C. wolgarica (Volga).* *fl.* yellow. May, June. *l.*, leaflets six or seven pairs, orbicular, velvety beneath, as well as the calyces. *h.* 2ft. to 3ft. Siberia, 1786. (W. D. B. 83.)

CALOPHANES (from *kalos*, beautiful, and *phaino*, to appear; alluding to the flowers). ORD. *Acanthaceæ.* A genus of about thirty species, widely distributed, principally in the tropical regions of both hemispheres. The best garden plant is that mentioned below; it is an interesting hardy herbaceous perennial, excellent for growing in borders, in loam and peat, or sandy loam soil; and may be propagated by dividing the roots, in March.

C. oblongifolia (oblong-leaved).* *fl.* blue; corolla funnel-shaped, throat ventricose, limb bilobed, nearly equal; tube of corolla one-half longer than the calyx; pedicels axillary. August. *l.* opposite, oblong-spathulate, entire, acuminated. *h.* 1ft. Florida, &c., 1832. (S. B. F. G., ser. ii., 181.)

CALOPHYLLUM (from *kalos*, beautiful, and *phyllon*, a leaf; the leaves are large, of a beautiful green, and elegantly veined). ORD. *Guttiferæ.* Fine stove evergreen trees. Flowers disposed in axillary racemes. Leaves furnished with numerous transverse, parallel nerves. They thrive in a compost of loam, sand, and peat. Cuttings of half-ripened shoots will root in sand, if placed under a glass, in bottom heat.

Calophyllum—*continued.*

C. Calaba. Calaba-tree. *fl.* white, sweet-scented, loosely racemose; racemes lateral, very short. *fr.* green. *l.* obovate or oblong, obtuse or emarginate. *h.* 30ft. West Indies, &c., 1780.

C. inophyllum (fibrous-leaved). *fl.* snow-white, sweet-scented, loosely racemose; racemes axillary; peduncles one-flowered, usually opposite. *fr.* reddish, the size of a walnut. *l.* oblong or obovate, obtuse, but usually emarginate. Branches round. Tropics of the Old World, 1793. A medium-sized tree.

CALOPOGON (from *kalos*, beautiful, and *pogon*, a beard; in reference to the fringe on the lip). ORD. *Orchideæ.* Very pretty, hardy, tuberous-rooted Orchids, admirably suited for a good shady position at the foot of the rockwork, or for an open situation in a hardy fernery. Propagated by offsets, taken from the tuberous roots; but this method of increase is very uncertain. Perhaps the only species in cultivation is the following:

Calopogon—*continued.*

C. pulchellus (beautiful).* *fl.* purple, with a very pretty pale yellow beard or tuft of hairs growing from the lip; two or three to a plant. Late summer. *l.* few, radical, grass-like. *h.* 1½ft. North America, 1791. SYN. *Limodorum tuberosum.* (S. B. F. G. 115.)

FIG. 330. CALODENDRON CAPENSIS.

CALOSANTHES INDICA. A synonym of *Oroxylum indicum.*

CALOSCORDUM (from *kalos*, beautiful, and *skorodon*, garlic). ORD. *Liliaceæ.* A genus of half-hardy bulbs, allied to *Allium*, but now referred to *Nothoscordum.* For culture, *see* **Calochortus.**

C. neriniæflorum (Nerine-flowered).* *fl.* rose; umbels about twelve-flowered; spathe one-valved. June and July. *l.* narrow, semi-terete, channelled above. *h.* 6in. Chusan, 1843. (B. R. 1847, 5.)

CALOSTEMMA (from *kalos*, beautiful, and *stemma*, a crown). ORD. *Amaryllideæ.* Handsome greenhouse bulbous plants, natives of New Holland. Flowers funnel-shaped, irregular; perianth with the orifice surmounted by a corona; stamens erect, united by their dilated bases; ovary three-celled, many-seeded. Leaves linear-lorate.

C. album (white). *fl.* white. May. *l.* ovate, acute, 3in. to 5in. long, 2in. to 3in. broad. *h.* 1ft. 1824.

C. luteum (yellow). *fl.* yellow. November. *l.* strap-shaped, narrow. *h.* 1ft. 1819. (B. M. 2101.)

C. purpureum (purple). *fl.* purple. November. *l.* like those of *C. luteum.* *h.* 1ft. 1819. (B. M. 2100.)

CALOTHAMNUS (from *kalos*, beautiful, and *thamnos*, a shrub; in reference to the elegance of the shrubs, from their scarlet flowers and terete leaves). ORD. *Myrtaceæ.* Greenhouse evergreen shrubs. Flowers scarlet, axillary and solitary, sessile. Leaves scattered, crowded, terete. They require much the same culture as *Callistemon.* Cuttings of young wood, firm at the base, will root in sand, if covered by a hand glass, which requires to be occasionally taken off and wiped, to prevent damp.

C. quadrifidus (four-cleft). *fl.* scarlet, somewhat secund; bundles of stamens four, distinct, equal. July. *l.* glabrous (as well as the flowers). *h.* 2ft. to 4ft. West Australia, 1803. (B. M. 1506.)

C. villosa (villous). *fl.* scarlet, quinquefid; bundles of stamens equal, distinct. July to September. *l.* villous (as well as the fruit). *h.* 2ft. to 4ft. West Australia, 1823. (B. R. 1099.)

CALOTIS (from *kalos*, beautiful, and *ous, otos*, an ear; in reference to the chaffy scales of the pappus, or seed-head). Allied to *Bellium.* ORD. *Compositæ.* Greenhouse or half-hardy herbaceous perennials, rarely annuals, all natives of Australia. Receptacle naked; involucre nearly equal, many-leaved, in a single or double row. They may be grown successfully in any ordinary garden soil. Propagated by divisions of the root.

C. cuneifolia (wedge-leaved).* *fl.-heads* blue, solitary, terminal. July and August. *l.* cuneate, cut, toothed at end. *h.* 1ft. 1819. Greenhouse herbaceous perennial. (B. R. 504.)

CALOTROPIS (from *kalos*, beautiful, and *tropis*, a keel; literally "beautifully twisted," apparently in reference to the corolla of *C. gigantea*). ORD. *Asclepiadeæ.* A genus of stove evergreen shrubs, or small trees. The three species bear large handsome flowers, in interpetiolar umbels. They thrive best in a mixture of loam, sand, and peat. Young cuttings, thinly dibbled in a pot of sand, strike root freely under a hand glass, in heat. Care must be taken that they do not receive an excess of moisture, or they will rot.

C. gigantea (gigantic).* *fl.* very handsome, a mixture of rose and purple; corona shorter than the gynostegium, obtuse, circinately recurved at the base; umbels sometimes, though rarely, compound, surrounded by several involucral scales. July. *l.* decussate, broad, wedge-shaped, bearded on the upper side at the base, woolly-downy on the under side, 4in. to 6in. long, 2in. to 3in. broad. *h.* 6ft. to 15ft. India, &c., 1690. (B. R. i. 58.)

C. procera (tall). *fl.* white; petals spreading, marked at the top by a purple spot. July. *l.* obovate-oblong, on short petioles, whitish from wool. *h.* 6ft. Persia, 1714. (B. R. 1792.)

CALPICARPUM. *See* **Kopsia.**

CALPIDIA. A synonym of **Pisonia** (which *see*).

CALTHA (a syncope of *kalathos*, a goblet; in allusion to the form of the perianth, which may be likened to a golden cup). Marsh Marigold. ORD. *Ranunculaceæ.* Hardy herbaceous perennials, of easy culture on the margin of a piece of water, or in a marshy bog, or in the ordinary border, where their showy blossoms look very brilliant.

Caltha—*continued.*

Propagation is readily effected by dividing the roots, in early spring, or in summer after flowering.

C. leptosepala (slender-sepaled).* *fl.* pure white, one to two upon erect, scape-like peduncles. May, June. *l.* radical, cordate, the margins nearly entire, or sometimes crenate. *h.* 1ft. North-western America, 1827. (H. F. B. A. 1, 10.)

FIG. 331. CALTHA PALUSTRIS MONSTROSA PLENA.

C. palustris (marsh).* *fl.* golden-coloured, large; peduncles furrowed. Spring. *l.* cordate, somewhat orbicular, roundly-crenate, with rounded auricles. Stems dichotomous, erect. *h.* 1ft. Great Britain. (Sy. En. B. 40.) The double forms of this species, under the names of *nana plena* and *monstrosa plena* (see Fig. 331) are excellent plants, and, though growing best in the immediate vicinity of water, and most appropriate for rough scenery, they, like the type, do very well in ordinary well-enriched soil. A variety named *purpurascens*, from Southern Europe, is also showy, more erect, and branching; the shoots and pedicels purplish.

C. p. biflora (two-flowered). A twin-flowered variety of *C. palustris.* North America, 1827. This is not quite so tall as the type, and the flowers are rather larger.

C. p. parnassifolia (Parnassia-leaved). *fl.* yellow, on few-flowered peduncles. April, May. *l.* cordate-ovate, crenated. *h.* 3in. to 4in. North America, 1815.

C. radicans (rooting).* *fl.* bright yellow, several in small cyme. April, May. *l.* reniform-cordate, sharply crenate-serrate, spreading. *h.* 6in. Scotland. (Sy. En. B. 41.)

CALTROPS. *See* **Tribulus.**

CALTROPS, WATER. *See* **Trapa natans.**

CALUMBA, FALSE. *See* **Coscinium fenestratum.**

CALUMBA ROOT. *See* **Jateorrhiza Calumba.**

CALUMBA WOOD. *See* **Coscinium fenestratum.**

CALYCANTHACEÆ. A natural order of shrubs, with square stems, having four woody axes surrounding the central one. Flowers solitary, lurid; calyx of numerous coloured sepals compounded with the petals. Leaves opposite, entire, exstipulate. The two genera known are *Calycanthus* and *Chimonanthus.*

CALYCANTHUS (from *kalyx, kalykos*, a calyx, and *anthos*, a flower; in reference to the calyx being coloured, and appearing like a corolla). Allspice. ORD. *Calycanthaceæ.* A genus of hardy, deciduous, North American shrubs. Flowers lurid purple, axillary, and terminal, stalked, sweet-scented; stamens numerous. Leaves opposite, oval or ovate-lanceolate, entire, generally rough on the surface; sweet-scented. All are handsome and well worth growing. They thrive best in a peaty compost, but grow freely in almost any soil. Increased by layers, put down in the summer; or by seed, sown as soon as ripe, or in spring, in a cold frame.

C. floridus (Floridan).* Carolina Allspice. *fl.* with a sweet apple scent. May. *l.* ovate, downy beneath, as well as the branchlets. Branches spreading. Wood and roots smelling strongly of camphor. *h.* 4ft. to 6ft. Carolina, 1726. See Fig. 332. (B. M. 503.) There are several varieties of this species.

Calycanthus—*continued.*

FIG. 332. FLOWERING BRANCH OF CALYCANTHUS FLORIDUS.

C. glaucus (glaucous).* *fl.* lurid purple, not strongly scented. May. *l.* ovate-lanceolate, acuminated, glaucous and pubescent beneath. *h.* 4ft. to 6ft. Carolina, 1726. SYN. *C. fertilis.* (B. R. 404.) *C. oblongifolius* is a variety with ovate-lanceolate elongated leaves.

FIG. 333. FLOWERING BRANCH OF CALYCANTHUS LÆVIGATUS.

C. lævigatus (smooth-leaved).* *fl.* lurid purple. May. *l.* oblong, thin, either blunt or taper-pointed, bright green, and glabrous, or nearly so, on both sides, or rather pale beneath. Branches strictly erect. *h.* 3ft. to 6ft. Mountains of Pennsylvania, &c., 1806. See Fig. 333. (B. R. 481.)

C. macrophyllus (large-leaved). A garden synonym of *C. occidentalis.*

C. occidentalis (Western).* *fl.* brick-red, sweet-scented, 3in. to 4in. across, each petal about 2in. long and ½in. broad. June to October. *l.* oblong or ovate-cordate, acuminate, slightly pubescent on the veins only beneath. *h.* 6ft. to 12ft. California, 1831. In California, this is called the Sweet-scented Shrub. SYN. *C. macrophyllus,* of gardens. (B. M. 4808.

CALYCIFLORÆ. A sub-division of dicotyledonous plants, having the stamens inserted on the calyx or disk.

CALYCIFORM. Formed like a calyx.

CALYCINE. Of, or belonging to, the calyx.

CALYCOPHYLLUM (from *kalyx,* a calyx, and *phyllon,* a leaf; in allusion to one of the teeth of the calyx being expanded into a large petiolate coloured leaf). ORD. *Rubiaceæ.* Stove evergreen shrubs, requiring a compost of loam, peat, and a little sand and charcoal. Cuttings of half ripe shoots will root in sand if placed under a bell glass, in bottom heat.

C. candidissimum (whitest).* *fl.*, corolla white, campanulate, with a bearded throat, three together, the middle one bearing a petiolate leaf, but the two lateral ones naked; corymbs terminal. *l.* ovate, bluntly acuminated, 2in. to 3in. long. *h.* 30ft. Cuba, 1830.

CALYCOTOME (from *kalyx, kalykos,* calyx, and *tome,* a section; lips of calyx fall off). ORD. *Leguminosæ.* A small genus of hardy, divaricately-branched, spiny shrubs, formerly included as a section of *Cytisus.* Flowers yellow, disposed in short branched leafy fascicles. For culture, *see* **Cytisus.**

C. spinosa (spiny). *fl.* yellow. June and July. *l.*, leaflets obovate-oblong. Branches angular, spiny. *h.* 5ft. to 6ft. Genoa, Corsica, &c., 1846. (B. R. 55.)

CALYCULATE. Having bracts so placed as to resemble an external or additional calyx.

CALYMMODON. *See* **Polypodium.**

CALYPSO (from the beautiful nymph, *Calypso,* or from Greek *kalypto,* to conceal; in reference to its place of growth). ORD. *Orchideæ.* An elegant terrestrial monotypic genus. It thrives well in half-shady spots on the margins of a rock garden or artificial bog, in a light, moist, vegetable soil, composed of peat, leaf soil, and sand, mulched with cocoa-nut fibre refuse in winter. Propagated by offsets.

C. borealis (Northern).* *fl.* solitary, delicate rose and brown, with a yellow crest on the lip; labellum longer than the sepals, the lateral lobes cohering in their upper part over the saccate central one, which is usually bifid at the tip, resembling those of a Cypripedium. Summer. *l.* solitary, thin, many-nerved, ovate or cordate. Stems usually thickening into pseudo-bulbs. *h.* 4in. High latitudes of Northern hemisphere, 1820. (B. M. 2763.)

CALYPTRA. Literally an extinguisher; applied to the hood which covers the theca in mosses.

CALYPTRANTHES (from *kalyptra,* a covering, and *anthos,* a flower; in allusion to the operculum of the flower). ORD. *Myrtaceæ.* Strong-growing stove evergreen shrubs or small trees. Peduncles axillary, many-flowered. Leaves feather-veined. They are of easy culture, in a compost of loam and peat, and may be propagated by layers, or by cuttings, placed in heat.

C. Chytraculia (Chytraculia). *fl.* white, small, glomerate; peduncles axillary and terminal, trichotomous, panicled, and are, as well as the flowers, clothed with rufous velvety down. March. *l.* ovate, attenuated at the apex, stiffish, glabrous. *h.* 10ft. Jamaica, 1778. (N. S. 1, 26.)

C. Syzygium (Syzygium). *fl.* white, on short pedicels; peduncles axillary, trichotomous, many-flowered. May to July. *l.* ovate, obtuse, stiff. *h.* 10ft. to 12ft. Jamaica, 1779.

CALYPTRARIA. *See* **Centronia.**

CALYPTRATE. Resembling an extinguisher.

CALYPTRIFORM. Shaped like an extinguisher.

CALYPTRION. *See* **Corynostylis.**

CALYPTROCALYX (from *kalyptra,* an extinguisher, and *kalyx,* a calyx, in allusion to the form of the outer perianth segments). ORD. *Palmeæ.* A monotypic genus of stove palms. For culture, *see* **Calamus.**

C. spicatus (spiked). *fl.*, spadices elongated, spicate, leafy at base; spathe opening longitudinally. *l.* terminal, pinnatisect; segments reduplicate, linear, acuminate, bifid at the apex; petiole fibrous at the base. Caudex finally smooth. *h.* 12ft. Moluccas. SYNS. *Areca* and *Pinanga globosa.*

CALYPTROGYNE (from *kalyptra*, an extinguisher, and *gyne*, a woman—pistil—in allusion to the form of the pistil). Including *Calyptronoma*. ORD. *Palmæ*. A small genus comprising five species of handsome stove Palms, allied to **Geonoma** (which *see* for cultivation).

C. Ghiesbreghtiana (Ghiesbreght's). *fl.*, peduncles erect, overtopping the leaves, bearing a single cylindrical, undivided spadix, 9in. to 12in. in length. *l.* pinnate, 2ft. to 5ft. long; pinnæ opposite or alternate, sessile, of unequal breadth, the narrower ones one to two-nerved, the broader ones six to ten-nerved, usually from six to twelve on each side of the rachis; the intervals between the pinnæ vary from 1in. to 2in.; petiole broadly sheathing at the base, from a few inches to 1¼ft. long. Stem short or absent. Mexico. A very elegant dwarf-growing species. SYNS. *Geonoma Ghiesbreghtiana*, *G. magnifica* and *G. Verschaffeltii*. (B. M. 5782.)

C. spicigera (ear-bearing). *l.* irregularly pinnate, 2ft. to 3ft. long, 1ft. broad, deeply bifid at apex, rich bright green; petioles short, sheathing at the base, flat on the upper side, rounded below. Stems stout. *h.* 5ft. Guatemala. A very elegant species.

C. Swartzii (Swartz's). *l.* equally pinnatisect; pinnæ deeply reduplicate at the base, bifid at the top. Trunk smooth. *h.* 50ft. to 60ft. Jamaica, 1878. A handsome plant when young, and useful for general decorative purposes. SYN. *Calyptronoma Swartzii*.

CALYPTRONOMA SWARTZII. *See* **Calyptrogyne Swartzii.**

CALYSTEGIA (from *kalyx*, a calyx, and *stege*, a covering; in reference to the two large persistent bracts enclosing the calyx). Bearbind. ORD. *Convolvulaceæ*. Hardy, glabrous, twining or prostrate herbs. Peduncles solitary, one-flowered; corolla campanulate, five-plicate. All the species are of easy cultivation in common garden soil. Propagation may be effected by dividing the plants; or by seeds, sown in spring.

C. dahurica (Dahurian).* *fl.*, corolla of a rosy-purple; sepals lanceolate, acute, the two outer ones broadest; peduncles tetragonal, tomentose; bracts broad-ovate, acute, longer than the calyx. July. *l.* glabrous or hairy, oblong-cordate, having the margins and nerves on the under side tomentose. Dahuria, 1826. (B. M. 2609.)

C. inflata (inflated). Synonymous with *C. sepium incarnata*.

FIG. 334. FLOWERING BRANCH OF CALYSTEGIA PUBESCENS FLORE-PLENO.

C. pubescens flore-pleno (downy, double-flowered).* *fl.* 2in. to 3in. across; petals long, narrow, wavy, and reflexed, flesh-colour, but ultimately bright rose; pedicels 2½in. to 3½in. long. Summer and autumn. *l.* alternate, hastate, downy. China, 1844. See Fig. 334.

C. sepium (hedge). Common Bindweed. *fl.* white, sometimes tinged with red; peduncles tetragonal, exceeding the petioles; bracts cordate, keeled, acute, longer than the calyx, but one-half shorter than the corolla. Summer. *l.* sagittate or cordate, very acute; hind lobes obtuse, or truncate, entire. Britain. A very troublesome weed. (Sy. En. B. 924.) There is a variety named

Calystegia *-continued.*

incarnata, with rose-coloured flowers. North America. SYN. *C. inflata*. (B. M. 732.)

C. Soldanella (Soldanella-like).* Sea Bells. *fl.* pale red, with five longitudinal, yellowish plaits, large; peduncles angular, angles winged; bracts large, ovate, blunt, mucronate, generally shorter than the calyx. June. *l.* rather fleshy, reniform, entire or a little angular. Sea-shores, Britain. This pretty species can only be grown with success in a very sandy soil. (Sy. En. B. 925.)

CALYTHRIX (from *kalyx*, a calyx, and *thrix*, a hair; in reference to the lobes of the calyx, which each end in a long hair). ORD. *Myrtaceæ*. A genus of very pretty and interesting greenhouse Heath-like shrubs, natives of Australia. Flowers small; bracteoles two under each flower; they are either free or joined together at the base, sometimes in the form of an operculum. Leaves scattered, crowded, opposite, full of dots, axillary, solitary, almost sessile. They grow well in a mixture of loam, peat, and sand, with good drainage and firm potting. Cuttings, made from young shoots, will root in April or May, if placed in sand, under a bell glass, in a cool house.

C. ericoides (Heath-like). A synonym of *C. tetragona*.

C. glabra (glabrous). A synonym of *C. tetragona*.

C. tetragona (tetragonal).* *fl.* white; bracts one-half shorter than the tube of the calyx. *l.* scattered, petiolate, glabrous; stipules deciduous. *h.* 2ft. 1825. SYNS. *C. ericoides*, *C. glabra*. (B. R. 409.)

C. angulata, *aurea*, and *breviseta* are other species which have been introduced, but are not worth house room when that described above is grown.

CALYX. The external whorl of floral leaves.

CAMARIDIUM (from *kamara*, an arched roof; in reference to the arched tip of the stigma). ORD. *Orchideæ*. A pretty stove orchid, allied to *Cymbidium*. It thrives best if grown in a shallow basket, or raised above the surface of the pots with sphagnum and broken pots.

C. ochroleucum (yellowish-white).* *fl.* yellowish-white. July. *l.* ligulate. Pseudo-bulbs oblong, compressed, smooth. *h.* 1ft. Trinidad, 1823. SYN. *Cymbidium ochroleucum*. (B. M. 4141.)

CAMAROTIS. *See* **Sarcochilus.**

FIG. 335. CAMASSIA ESCULENTA.

CAMASSIA (from *Quamash*, so called by the North American Indians, who eat the bulbs). SYN. *Sitocodium*. ORD. *Liliaceæ*. A small genus (two species) of handsome bulbous plants. Perianth of six segments, slightly connected at base, and spreading out horizontally, but not equally.

Camassia—*continued.*

Leaves narrow, about 1ft. long, grooved down the inside. They thrive best in a sheltered, partially-shaded situation, but will do fairly well in almost any ordinary good garden soil. A compost of loam and leaf mould, with a liberal mixture of sharp sand, suits them best. They need not be disturbed for several years; but a top-dressing of rich soil or well-rotted manure may be given yearly. Propagated by offsets and seeds. The plants are so hardy that they ripen seeds in warm situations. These may be sown as soon as ripe, or the following spring, either in a warm situation out of doors, or in pots or boxes, under glass. The young plants make rapid progress, and should remain for at least two years in the seed beds. The best time for final transplanting is in February. Offsets are produced very freely, and should be removed either when in a dormant condition, or just previously to starting into fresh growth, and arranged in clumps or lines, placing a little sand about them.

C. esculenta (edible).* Camash or Quamash. *fl.* blue, about 2in. across; racemes loose, ten to twenty-flowered, borne on stout scapes; perianth six-cleft, the five upper segments close together, the sixth standing by itself. Summer. *l.* linear, about 1ft. high. Columbia, &c., 1837. The colour of the flowers varies from a deep blue to nearly white. See Fig. 335. (B. R. 1486.) The white-flowered form is figured in B. M. 2774, under the name of *Scilla esculenta flore albo.*

C. e. Leichtlini (Leichtlin's).* *fl.* creamy-white, larger than those of the type, with more numerous nerves in the keel of the segments of the perianth; racemes longer, and sometimes compound. Spring. *h.* 2ft. Columbia, 1853. This also differs from the type in its more robust habit and broader leaves. SYN. *Chlorogalum Leichtlini.* (B. M. 6287.)

C. Fraseri (Fraser's).* *fl.* pale blue, smaller than those of *C. esculenta*; pedicels and scape much more slender. *l.* narrow, acute; capsule more acutely angled. *h.* 1ft. Eastern States of North America. A smaller and more slender plant. (B. M. 1574, as *Scilla esculenta.*)

CAMBESSEDESIA (named after James Cambessedes, coadjutor of Auguste St. Hilaire, in his "Flora Brasiliæ Meridionalis," and author of several botanical memoirs). ORD. *Melastomaceæ.* A genus of elegant, erect, or ascending, dichotomously branched stove shrubs or herbaceous plants. Flowers terminal and axillary, in paniculate cymes; petals five, obovate; calyx bell-shaped. Leaves sessile, opposite or verticillate, obovate, oblong or linear. They thrive best in a compost of peat and sand. Propagated by half-ripened cuttings, which root freely in a similar mixture, if placed in heat and under a hand glass. There are about eight species known to science, but probably that mentioned below is the only one in cultivation.

C. paraguayensis (Paraguay). *fl.* rose-red, §in. in diameter, in terminal corymbose, glandular, hairy panicles. July. *l.* nearly 1in. long, sessile, ovate, acute, three-nerved, pale green, with entire ciliate margins. Stem annual, herbaceous, leafy. *h.* 10in. to 18in. 1880. (B. M. 6604.)

CAMBIUM. The formative fluid found between the bark and wood of Exogens, in spring.

CAMBUY FRUIT. *See* **Eugenia.**

CAMELLIA (named in honour of George Joseph Camellus or Kamel, a Moravian Jesuit and traveller in Asia, who wrote a history of the plants of the Isle of Luzon, which is inserted in the third vol. of John Ray's "Historia Plantarum"). Japanese Rose. Including *Thea.* ORD. *Ternstræmiaceæ.* A genus of elegant hardy or nearly hardy evergreen shrubs or trees. Flowers large; sepals five or six, gradually passing from bracts into petals, the latter slightly cohering at the base; stamens numerous. Leaves coriaceous. By close attention to a few particulars in the management of these beautiful plants, much disappointment may be avoided, and a succession of flowers obtained from October till the following July. The fact of the buds frequently dropping off, deters many would-be growers from attempting the culture of the Camellia. Dryness of the atmosphere, and want of water at the roots, are generally the primary causes of failure; the remedy for these evils rests with the cultivator. The roots are apt to

Camellia—*continued.*

get matted together, compressing the earth around them into a hard ball, impervious to water; hence attention is necessary to see that the water poured into the pot thoroughly moistens all the soil. In order to form handsome plants, they should be trained with single stems to rods, and pruned, so as to make them throw out side branches from every part of the stem; they must not be placed too close to each other on the stage, or when planted out. A liberal supply of water is always necessary, but especially so during the flowering period. Plants that are required to flower early may remain in the warm house till they commence to blossom, when they should be removed to a cold place, such as the back of a greenhouse, giving them plenty of light. Those kept in a hothouse or vinery during summer, will flower in the beginning or middle of October; and a large plant, having from fifty to one hundred buds, will continue in flower till the month of January. Those that are removed early, will blossom in January, and so succeed the others. The plants that have finished flowering should be brought back to the hothouse, where they will begin to make new wood, and be ready to come in succession next season. By thus shifting the plants from a warm to a cold situation, a regular succession will be secured from October to July. The soil should be kept constantly moist, and in the summer months the leaves occasionally syringed. Camellias flower best when kept in small pots or tubs. In order to raise and exhibit these handsome plants to the best advantage, they should be grown in a separate house, of ample height, as they never look so well as when 6ft. or 8ft. high, trained in a conical form, with branches from the root upwards; and the plants should be raised near to the glass on a movable stage, which should be lowered as they grow. In summer, they may either be placed in the open air in a sheltered spot, or the glass roof of the house can be taken off. The hardier sorts, such as the Double-red, Blush, and Pæony-flowered, succeed in the bed or border of a conservatory, if the roof can be taken off in summer, so as to admit air. If this cannot be managed, they are better grown in portable pots or boxes. The most suitable time for shifting Camellias is directly after flowering; they should then be put into a vinery or hothouse, where there is a little heat; or the warmest part of a greenhouse. They will soon begin to make new wood, where they should be allowed to remain, amply supplied with water, till they form their flower buds, at the extremity and sides of the young growth. A few should then be removed to a cold place, and shaded during strong sunshine. In a few weeks afterwards, others may also be transferred, so as to have a regular succession of flowering plants.

Propagation. The red Camellias are generally propagated by layers, but cuttings will also succeed; the single red Camellia being raised by either cuttings, layers, or seeds. This latter forms suitable stocks on which to inarch or graft the rarer kinds. The ripened shoots of the preceding summer should be taken off in August, cutting them smoothly at a joint or bud. Two or three of the lower leaves should be taken off, and the cuttings planted firmly in the soil with a dibble. Some growers use peat earth and sand to strike in, while others prefer a loam mixed with sand and peat. The pans containing the cuttings should be kept in a plant or cold frame, without being covered with glasses, but shaded during powerful sunshine. In the following spring, such as have struck will begin to push, when they need to be placed in a gentle heat. The following September or October, the rooted plants will be fit to pot off, and in the second or third spring they may be used as stocks. Inarching or grafting is done in early spring, as soon as growth commences. When this process is completed, care must be taken to fix the pot containing the stock so that it may not be disturbed during the connection of the scion with the parent plant. The grafting being clayed over, is then covered with moss, to prevent its cracking. When independent grafting is resorted to, the

Camellia—*continued.*

mode called "side grafting" is generally employed, as in the case of Orange-trees; but the operation of tongueing is generally omitted, as tending to weaken the stock. Liquid or other manure is not required; nor is it desirable to apply it, as it often, sooner or later, causes the destruction of the plants. As a rule, insects do not trouble this class of plants; but scale will sometimes appear, and can easily be removed by hand. Thrips occasionally put in an appearance, but a little smoke will quickly get rid of them.

C. euryoides (Eurya-like). *fl.* white; peduncles lateral, one-flowered, scaly. May to July. *l.* ovate-lanceolate, acuminate, serrated, silky beneath. Branches hairy. *h.* 4ft. China, 1822. (B. R. 983.)

FIG. 336. FLOWERING BRANCH OF CAMELLIA JAPONICA.

C. japonica (Japanese).* Common Camellia. *fl.* variously coloured, axillary, sessile. *l.* ovate, acuminate, acutely serrated. *h.* 20ft. Japan and China, 1739. The innumerable hybrids are chiefly the offspring of this species. See Fig. 336.

FIG. 337. FLOWER OF CAMELLIA JAPONICA ANEMONÆFLORA.

Camellia—*continued.*

C. j. anemonæflora (Anemone-flowered). All, or nearly all, the stamens, &c., in this variety are transformed into small petaloid bodies, and the flower has the general aspect of a double Anemone. See Fig. 337. (B. M. 1654.)

FIG. 338. FLOWER OF CAMELLIA OLEIFERA.

C. oleifera (oil-yielding).* *fl.* white, very numerous, fragrant, solitary. November. *l.* elliptic-oblong, acute, serrated, coriaceous, shining. *h.* 6ft. to 8ft. China, 1820. See Fig. 338. (B. R. 942.)

C. reticulata (netted-leaved). *fl.* bright rose, large, semi-double. *l.* oblong, acuminated, serrated, flat, reticulated. *h.* 10ft. China, 1824. There is a form of this species with full double flowers.

C. theifera (Tea-bearing). *fl.* white, spreading, of five sepals and five petals, axillary. November to spring. *l.* elliptical-oblong, obtuse, serrated, more than twice as long as broad, dark green. *h.* 2ft. to 6ft. China, Japan, and India, 1780. This species varies very considerably. In different countries, it has become modified by cultivation. The Green and Black Teas, formerly supposed to be produced by different species, are obtained from the same bushes, but subjected to different processes.

Less-known species are: *drupifera*, *lanceolata*, *rosæflora*, and *Sasanqua*.

The true species are rarely seen in cultivation. The following is a selection of the best forms of *C. japonica*; the list is a limited one, and is capable of great extension:

ALBA PLENA,* double white; ARCHIDUCHESSE AUGUSTA, petals deep red, veined with blue, a white band; ARCHIDUCHESSE MARIE,* flowers bright red, banded with white, imbricated; AUGUSTE DELFOSSE, bright reddish-orange, stripes down the centre of petals; AUGUSTINA SUPERBA,* flowers clear rose, free bloomer; BEALII ROSEA, one of the best and latest deep crimson varieties known; BICOLOR DE LA REINE, white and rose; BONOMIANA,* ground colour white, banded with intense deep red; CARYOPHYLLOIDES,* white, marbled with rosy-carmine, flowers very large; CHANDLERII ELEGANS,* flowers large, light rose; COMTE DE GOMER,* petals soft rose, striped with crimson, beautifully imbricated; COMTE DE PARIS, rich pink, large and full; CONTESSA LAVINIA MAGGI, pure white, broadly flamed with rosy-cerise; CONTESSA LAVINIA MAGGI ROSEA, flowers rich rosy-red, fine form, a superb variety; CORRADINO, rose, veined with salmon, centre delicate blush pink; COUNTESS OF DERBY,* beautifully imbricated, white, striped with rose; COUNTESS OF ELLESMERE,* colour varying from pure white to flesh, streaked with carnation; COUNTESS OF ORKNEY, pure white, striped with carmine, sometimes pink, shaded with deep rose; CUP OF BEAUTY,* pure white and rose, a beautifully imbricated flower; DAVID BOSCHI, clear pink, shaded with deep rose; DE LA REINE, petals white, striped with carmine; DONCKELAARII,* large flowers, semi-double, rich crimson, marbled white; DUCHESSE DE NASSAU,* flowers light pink, very large, and of superb form; DUCHESS OF BERRY, pure white, and cupped, beautifully imbricated, one of the most beautiful of all the double whites; EMPEROR OF RUSSIA, large crimson; FANNY BOLIS, white, striped and splashed with deep crimson; FIMBRIATA ALBA,* similar to *Alba plena*, outer petals notched at the edges; GENERAL CIALDINI, beautifully imbricated, bright carmine, flaked with red; HENRI FAVRE, flowers rosy-salmon, finely imbricated; HOVEY, C. H.,* bright crimson, well imbricated; HOVEY, C. M.,* deep velvety crimson, darkly shaded, very distinct; HOVEY, MRS.,* delicate pink, very smooth in outline, medium size; IL CYGNO, flowers pure white, petals Ranunculi-formed and imbricated; IL 22 MARZO, clear rose, the petals sometimes banded with white; IMBRICATA, deep carmine, occasionally variegated; JARDIN D'HIVER, a fine variety, flowers beautifully imbricated, colour

Camellia—*continued.*

bright rose: JEFFERSONII, fine crimson; JENNY LIND,* flowers imbricated to the extreme centre, broad, and of good substance, white, striped and marbled with rose; JUBILEE,* flowers very large, with broad, round, imbricated petals, white, marbled with rose, centre pure white; LADY HUME'S BLUSH,* flowers flesh-colour, and of excellent form; LA MAESTOSA, rose, mottled with white; LEEANA SUPERBA, flowers salmon-red, very fine;

Camellia—*continued.*

LEON LEGUAY, rich crimson; MADAME AMBROISE VERSCHAFFELT,* white, shaded with blush, and dotted with red; MADAME LEBOIS, bright rose, finely imbricated, and of good form; MATHOTIANA,* flowers brilliant red, and beautifully imbricated, extra fine; MATHOTIANA ALBA, flowers large, finely imbricated to the centre, pure white; MONTIRONI,* a fine pure white flower; MRS. ABBEY WILDER, ivory-white, striped with rose, well imbricated;

1. C. lactiflora. 2. C. rotundifolia Hostii. 3. C. carpathica turbinata. 4. C. carpathica alba.

FIG. 339. GROUP OF CAMPANULAS.

Camellia—*continued.*

MRS. COPE,* white, delicately shaded with pink, and striped with rose; MRS. DOMBRAIN,* shape and substance excellent, colour beautiful soft pink; NAPOLEON III., flowers rose, beautifully veined with deep rose, and edged with pure white; PRINCE ALBERT, white, beautifully flaked with carmine; PRINCESS BACCIOCCHI,* rich velvety carmine; PRINCESS FREDERICK WILLIAM,* flowers white, tipped with bright carmine; QUEEN OF ROSES, flowers delicate rose; REINE DES BEAUTÉS,* very delicate clear rose, fine form, extra fine variety; REINE DES FLEURS,* finely imbricated, petals of good substance and perfect symmetry, colour vermilion-red, flaked occasionally with white; RUBENS, deep rose-white stripes; SACCOIANA,* a finely imbricated flower, colour very variable, occasionally clear rose, at other times spotted with pure white; SARAH FROST, flowers bright red; STORYI, outer petals bright rose, centre almost white; TARGIONI, flowers beautifully imbricated, pure white, striped with cerise; TEUTONIA, flowers sometimes red, at other times white, but occasionally half red and half white; THOMAS MOORE,* flowers 4½in. across, perfectly round, and well imbricated, petals also round, and well filled up in the centre, colour rich carmine, shaded with crimson; TRICOLOR DE MATHOT, flowers red, marbled with white, semi-double; TRICOLOR IMBRICATA PLENA, blush white, flaked with carmine and rose; VALTEVAREDA, colour bright rose, often spotted with snowy white; WILDERII,* soft rose, of excellent form.

CAMOENSIA (named in honour of Luis Camoens, a celebrated Portuguese poet). ORD. *Leguminosæ*. A genus containing a couple of handsome species. *C. maxima* is the largest-flowered leguminous plant known. It thrives well in rich loam and leaf mould. Cuttings root in sandy loam, in bottom heat, if placed under a bell glass. It has not yet flowered in this country. The other species has not been introduced.

C. maxima (greatest).* *fl.* cream-colour, yellow, 1ft. long, in short axillary racemes. Angola, 1878. (T. L. S. 25, 36.)

CAMOMILE. *See* **Chamomile.**

CAMPANEA (from *campana*, a bell; alluding to the shape of the flowers). ORD. *Gesneraceæ*. Stove herbaceous climbing perennials, the only one at present introduced being *C. grandiflora*. For cultivation, *see* **Gesnera.**

C. grandiflora (large-flowered).* *fl.* in axillary tufts, at ends of long, axillary, and terminal peduncles; corolla white, lined and dotted with crimson. June. *l.* opposite, oval, acuminated, oblique, soft, crenated, stalked. Plant hairy. *h.* 2ft. Santa Fé, 1848. (R. H. 1849, 241.)

CAMPANULA (diminutive of *campana*, a bell; in reference to the shape of the flowers). Bell-flower; Slipperwort. ORD. *Campanulaceæ*. A genus of mostly perennial—rarely annual or biennial—herbs. Flowers blue or white, for the most part pedunculate, usually racemose, rarely spicate or glomerate. Radical leaves usually different in form from the cauline ones, especially in size. All the species of this genus are elegant when in flower (see Fig. 339), and are very largely grown. The dwarf varieties make excellent subjects for pot culture, rockeries, or the fronts of borders. A rather rich sandy loam, with plenty of drainage, suits these plants. The forms of *C. pyramidalis* may be kept in cold frames during the winter, and firmly repotted in summer, the crown of the plant being kept just a trifle raised above the soil, or they are at times liable to damp off, through the water lodging around the necks. During hot weather, the pots should be plunged in a bed of ashes. Campanulas are easily raised from seeds, which should be sown in spring.

General Culture. As a rule, few plants are so easily cultivated as these. The strong-growing kinds may be grown with the greatest success in ordinary garden soil, well enriched with manure, while the alpine kinds are easily managed on the rockery. Sow seeds of the annuals in April, and of the biennials in June, in the open, or in a cold frame. The perennials are chiefly propagated by dividing the roots, or by young cuttings, in spring—the latter is by far the best method of propagation with many of the species—or by seeds. Those kinds requiring special treatment are particularised, and those suitable to the rockery are so designated. Perennials, except where otherwise mentioned.

C. Adami (Adam's). *fl.* bluish, nearly erect, one on the top of each stem; corolla funnel-shaped. July. *l.* slightly ciliated; radical ones on long petioles, cuneate-spathulate, coarsely toothed at the apex; cauline ones sessile, obovate or linear. *h.* 6in. Caucasus, 1821. Alpine.

Campanula—*continued.*

C. Allionii (Allioni's).* *fl.* usually blue, rarely white, subnutant, large, solitary. July to September. *l.*, radical ones linear-lanceolate, nearly entire, ciliated; lower ones rosulate, bluntish. Stem rather pilose. Root creeping. *h.* 3in. to 4in. Piedmontese Alps, &c., 1820. A little gem, requiring a well-drained position, in rich sandy loam, with plenty of grit in it, and an abundance of moisture when growing. SYNS. *C. alpestris* and *C. nana*. (B. M. 6588.)

C. alpestris (rocky). A synonym of *C. Allionii*.

C. alpina (alpine).* *fl.* deep blue, few or numerous, scattered in a pyramidal manner along the whole stem. July. *l.* linear-lanceolate, repandly-crenate, woolly; radical ones crowded, narrowed at the base. Stem glabrous or woolly. *h.* 3in. to 9in. Europe, 1779. Rockery. (B. M. 957.)

C. americana (American). *fl.* erect, one to three from the axil of each bract; corollas blue, a little longer than the calycine lobes. July. *l.*, radical ones rosulate, ovate, acute, a little cordate, petiolate, serrated; cauline ones ovate-lanceolate, acuminated at both ends, serrulated. *h.* 3ft. to 6ft. North America, 1763. Borders.

C. barbata (bearded).* *fl.* nutant, disposed in a loose, often secund raceme; pedicels one-flowered, rising from the axils of the superior leaves; corolla pale blue or white (in the variety *alba*), glabrous outside, but woolly in the mouth. June. *l.* villous, nearly entire; radical ones crowded, lanceolate; cauline ones few, ligulate. *h.* 6in. to 18in. European Alps, 1752. This is best grown on the rockery. The white variety is very handsome. (B. M. 1258.)

C. Barrelierii (Barrelier's). A synonym of *C. fragilis*.

C. betonicæfolia (Betony-leaved).* *fl.* terminal and axillary, the branchlets usually bearing three; corollas purplish-blue, with a pale yellow base, tubular. May. *l.* elliptic-oblong or ovate, acute, crenate-toothed; radical ones shortly petiolate. Stems much branched. Plant pilose. *h.* 1½ft. Mount Olympus in Bithynia, 1820. Borders. (S. F. G. 210.)

C. bononiensis (Bononian).* *fl.* bluish-violet, rather small, numerous, disposed in long racemes. July. *l.* serrulated, ovate, acuminate, dark green above, pale beneath; radical ones cordate, petiolate; upper ones stem-clasping. *h.* 2ft. to 3ft. Europe, 1773. Borders. There is also a very showy white-flowered variety.

C. cæspitosa (tufted).* *fl.* drooping, terminal, solitary, and sometimes three to four at the top of each stem; corollas deep blue or pure white (in the variety *alba*). May to August. *l.*, radical ones crowded, on short petioles, ovate, glandularly toothed, shining. Stems numerous, tufted. Root fibrous, creeping. *h.* 4in. to 6in. Temperate parts of Europe, 1813. Rockery, delighting in rich fibrous loam and leaf mould.

FIG. 340. FLOWERING STEM OF CAMPANULA CARPATHICA.

C. carpathica (Carpathian).* *fl.* blue, broadly campanulate, disposed in loose panicles, on long peduncles, which are elongated, naked, and terminated by an erect flower. June to August. *l.*, lower ones on long petioles, ovate-roundish, cordate, toothed; upper ones on short petioles, ovate, acute. Stems leafy, branched.

Campanula—*continued.*

h. 9in. Transylvania, 1774. Borders or rockery. See Fig. 340. (B. M. 117.)

C. c. alba (white).* *fl.* quite white, otherwise like the type. See Fig. 339.

FIG. 341. CAMPANULA CARPATHICA PELVIFORMIS.

C. c. pelviformis (pelvis-formed).* *fl.* lilac, nearly 2in. across, numerously produced in lax panicles on much-branched stems, 9in. to 18in. high; fragrant. August. *l.* ovate, cordate, toothed. A distinct seedling from *C. c. turbinata.* See Fig. 341.

FIG. 342. CAMPANULA CARPATHICA TURBINATA.

C. c. turbinata (top-shaped).* *fl.* nearly 2in. across, erect; corolla deep purple, campanulate. Summer. *l.* ovate, rigid, greyish-green, toothed, and pointed, with cordate bases, in stiff tufts. Stems short, erect. *h.* 6in. to 12in. Transylvania, 1868. Borders or rockery. See Figs. 339 and 342. There is also a desirable variety named *pallida*, with very pale purple flowers.

C. c. t. Hendersoni (Henderson's). *fl.* rich mauve, in large pyramidal racemes, rather open. July to September. *l.*, lower ones cordate, or ovate cordate, slightly crenulated, on long stalks; upper ones oblong, sessile. *h.* 1ft. Very handsome hybrid for borders.

C. caucasica (Caucasian). *fl.* few, terminal and axillary, drooping; corollas glabrous outside, but bearded inside, of a violaceous-blue colour. July. *l.* crenulated; lower ones obovate, obtuse, petiolate; upper ones lanceolate, sessile. Stems erect, branched, terete, scabrous, pilose. *h.* 6in. to 9in. Caucasus, 1804. Rockery; very pretty.

C. celtidifolia (Nettle-tree-leaved). A synonym of *C. lactiflora.*

C. cenisia (Mont Cenis).* *fl.* deep blue, solitary, terminal, erect. June. *l.* entire; radical ones rosulate, obovate, obtuse; cauline ones ovate-oblong. Stems numerous, glabrous, or slightly pilose. *h.* 3in. Italy, &c., 1775. A rare little rockery gem, requiring a deep gritty loam and leaf soil, between stones. (A. F. P. 3, 6.)

C. Cervicaria. Throatwort. *fl.* blue, pilose outside; heads terminal, round, bracteate. July. *l.* crenately serrated; radical ones linear-lanceolate, bluntish, on short petioles; cauline ones linear-acuminated. Stem simple. *h.* 1ft. to 2ft. Mountains of Europe, 1768. Biennial. Borders. (L. B. C. 452.)

C. collina (hill).* *fl.* deep blue, funnel-shaped, few, secund, disposed in a long raceme. July. *l.*, lower ones on long petioles, ovate-oblong, crenulated; middle ones lanceolate; upper ones linear-acuminated. Stems simple, rather pilose. *h.* 1ft. Caucasus, 1803. Borders. (B. M. 927.)

C. colorata (coloured). *fl.* purple; corolla tubular, velvety; peduncles elongated, terminal and axillary. September. *l.*

Campanula—*continued.*

scattered, lanceolate, acute, repandly denticulated. Stem branched, downy. Sikkim Himalayas, 1849. This requires frame protection during winter. (B. M. 4555.)

C. dichotoma (forked). *fl.* bluish-purple, with a paler tube, drooping, terminal, solitary in the forks of the branches and stem. July. *l.*, cauline ones ovate, acute, a little crenated. Stem erect, with dichotomous branches. Plant clothed with stiff hairs. *h.* 6in. South-western Europe, 1820. Annual. Borders. (S. F. G. 211.)

C. drabifolia (Draba-leaved). *fl.* pedicellate, opposite the leaves; corolla inflated, with a white tube and a violaceous-blue limb. July. *l.* elliptic-oblong, toothed. Stem many times forked, slightly erect. Plant hispid. *h.* 3in. Island of Samos, 1823. Annual. Rockery. (S. F. G. 215.)

C. Elatines (Elatine).* *fl.* scattered over the upper part of the plant, sometimes racemose, and sometimes panicled; corollas bluish-purple. June to August. *l.* cordate, coarsely and acutely toothed, ovate-acute; lower ones roundish. Stem branched. Plant downy. *h.* 3in. to 6in. Piedmont, 1823. Rockery. (A.F.P.3,7.)

C. Erinus (Erinus).* *fl.* terminal and axillary, situated in the angles of the forks of the branches; corollas of a pale bluish-rose-colour, or white, pilose at the base, tubular. May to August. *l.* obovate or ovate, toothed. Stem much branched. Plant hispid. *h.* 3in. to 9in. Europe, 1768. Annual. Rockery. (S. F. G. 214.)

C. excisa (excised). *fl.* drooping; stem one-flowered; corollas blue, funnel-shaped. June. *l.* entire, or remotely-denticulated, linear-acuminated. Stems numerous, erect, slender, simple, naked at top. *h.* 3in. to 6in. Switzerland and Transylvania, 1820. Rockery. A rare species, requiring to be treated like *cenisia.* (L. B. C. 561.)

C. floribunda (many-flowered). A synonym of *C. isophylla.*

FIG. 343. FLOWER-SPIKE OF CAMPANULA GLOMERATA.

C. fragilis (fragile).* *fl.* clear lilac-purple, white in the centre, solitary or in pairs, axillary, erect, or nearly so, on spreading branches. July and August. *l.*, radical ones reniform, or roundish-cordate, rather deeply lobed; cauline ones broadly-ovate, slightly cordate, all stalked. *h.* 4in. to 6in. South Italy. SYN. *C. Barrelierii.* (B. M. 6504.)

C. garganica (Gargano).* *fl.* axillary, in fascicles; corollas blue, rotate, deeply five-lobed. May to September. *l.*, radical ones reniform, on long petioles; cauline ones cordate, all crenately toothed, downy. *h.* 3in. to 6in. Italy, 1832. An extremely variable species. Rockery, in rich sandy loam. (B. R. 1768.)

C. glomerata (clustered).* *fl.* sessile, disposed in terminal heads on the branches and stems; corollas bluish-violet or white, glabrous, except the nerves outside, funnel-shaped. May to September. *l.* serrulated; radical ones ovate, acute; bracts ovate, acuminated. Stems simple, or branched. *h.* 1ft. to 2ft. Britain, &c. Borders. See Fig. 343. (Sy. En. B. 866.) A double-flowered variety, and also a white-flowered form, are very desirable. There are numerous varieties of this species which are frequently described as distinct species. The following are among the number:

C. g. cervicaroides (Cervicaria-like). *fl.* bluish-violet, terminal and axillary. Lower leaves on long petioles. Stem flexuous, hairy.

C. g. elliptica (elliptical). *fl.* blue, large, capitate. *l.* on long petioles, elliptic; bracts large, often longer than the flowers.

C. g. nicæensis (Nice). *fl.* bluish-violet, disposed in short, dense spikes. *l.* approximate, ovate, acute, sessile.

C. g. pusilla (diminutive).* *fl.* few, capitate. *l.* round, cordate. *h.* 1in. to 2in. In addition to these, there are *aggregata* and *speciosa* (= *dahurica*). The latter is an excellent variety, with large heads of deep-coloured flowers.

C. grandiflora (large-flowered). *See* **Platycodon grandiflorum.**

Campanula—*continued.*

C. grandis (large).* *fl.* pale violet-blue, broadly bell-shaped, with large pointed divisions, axillary and alternate, on the upper part of the stem. June. *l.* sessile, lanceolate, serrated. Stem simple, furrowed. *h.* 1ft. to 2ft. Siberia, 1842. Borders. There is also a very showy white-flowered variety named *alba*.

C. haylodgensis (Hay Lodge). *fl.* light blue, rather open, bell-shaped, few, at the ends of the stems. August. *l.*, radical ones tufted, roundish-cordate, with the margins slightly indented; cauline ones ovate-cordate, conspicuously toothed, light green. *h.* 6in. to 9in. Rockery. This is a hybrid, raised by Mr. Anderson-Henry, Hay Lodge, Edinburgh, probably between *C. carpathica* and *C. pusilla*.

C. hederacea (Ivy-like). *See* **Wahlenbergia hederacea.**

C. Hostii (Host's). A synonym of *C. rotundifolia Hostii.*

C. isophylla (equal-leaved).* *fl.* numerous, erect, disposed in a corymb; corolla lilac-blue, with a grey centre, large, salver-shaped, deeply five-lobed. August. *l.* broadly ovate, cordate, and toothed. Stems firm. North Italy, 1868. Borders and rockery. SYN. *C. floribunda.* (B. M. 5745.)

C. i. alba (white).* *fl.* pure white; in other respects like the species. It is a charming rockery plant, flowering very freely.

FIG. 344. FLOWERS OF CAMPANULA LACINIATA.

C. laciniata (cut-leaved). *fl.* long-stalked, in lax panicles. Stem erect, branchy, somewhat hairy. *h.* 1ft. Islands in Grecian Archipelago, 1790. This biennial species is impatient of much moisture during winter, and is therefore best kept in a cold frame. See Fig. 344.

C. lactiflora (milk-coloured-flowered).* *fl.* in loose panicles; peduncles erect, short, usually three-flowered; corollas erect, milk-coloured, tinged with blue, or quite blue, as in the variety named *cærulea*. July to September. *l.* sessile, ovate-lanceolate, acutely serrated. Stems branched. *h.* 2ft. to 6ft. Caucasus, 1814. Borders. SYN. *C. celtidifolia.* See Fig. 339. (B. R. 241.)

FIG. 345. CAMPANULA LANGSDORFFIANA.

C. Langsdorffiana (Langsdorff's). *fl.* blue, either solitary or in few-flowered panicles, not unlike those of *C. rotundifolia.* *l.* either entire or toothed. *h.* 3in. to 9in. Mountains of Northern Asia and America. Perennial. See Fig. 345.

Campanula—*continued.*

C. latifolia (broad-leaved). *fl.* disposed in spicate racemes; peduncles erect, one-flowered; corolla blue, but sometimes white (in the variety *alba*) campanulately funnel-shaped, large. July. *l.* large, doubly serrated; radical ones petiolate, cordate, ovate-oblong; cauline ones sessile, ovate-acuminated. Stems simple, smooth. *h.* 1ft. to 2ft. Britain. (Sy. En. B. 868.)

C. l. eriocarpa (woolly-fruited). *fl.*, tube of calyx very hispid. *l.* less acuminated. Stem and leaves pilose and pale. Caucasus, 1823. Borders.

C. l. macrantha (large-flowered).* *fl.*, corollas purplish-blue, larger than those of the type. Stem and leaves rather pilose; teeth of leaves more distinct. A hybrid. Borders.

C. Loefflingii (Loeffling's). *fl.* solitary, terminating the naked branchlets, loosely panicled, drooping; corolla blue or violaceous, with a deeper-coloured zone beneath the middle, white at the base, both inside and out, funnel-shaped. July. *l.* crenulated; lower ones ovate-reniform; superior ones ovate, stem-clasping. Stem much branched. Annual. *h.* 6in. to 18in. South-west Europe, 1818. (B. R. 29, 19.)

C. Loreyi (Lorey's). A synonym of *C. ramosissima.*

C. lyrata (lyrate). *fl.* disposed in a long, many-flowered, loose raceme; corolla blue, tubular, with rather pilose nerves. June. *l.*, lower ones petiolate, cordate, ovate, acute, crenated; superior ones sessile, ovate-lanceolate, serrate-toothed. Stem branched. Eastern Europe, Levant, &c., 1823. Borders.

FIG. 346. CAMPANULA MACROSTYLA.

C. macrostyla (large-styled). *fl.* dull purple, reticulated with violet, solitary, on stout stalks; hairy towards the base. July. *l.*, lower ones ovate-oblong, acute; upper ones ovate-lanceolate, recurved, small for the size of the plant, hispid on both surfaces, and ciliated with bristles. *h.* 1ft. to 2ft. Taurus Mountains. Annual. Borders. The rigid habit, bristly, almost prickly, stem and leaves, curious calyx appendages, short gaping corolla, and wonderful stigma, mark this as the most singular Campanula hitherto introduced. See Fig. 346.

C. Medium (middle-sized).* Canterbury Bells. *fl.* numerous, large, disposed in racemes; corolla blue, purple, and white, campanulate, inflated, single and double. July. *l.* sessile, ovate-lanceolate, crenately toothed. Stem erect, branched. *h.* 1ft. to 4ft. South Europe, 1597. See Fig. 347. A well-known and very handsome biennial, of which there are numerous varieties. Borders.

C. muralis (wall). A synonym of *C. Portenschlagiana.*

C. nana (dwarf). A synonym of *C. Allionii.*

C. nitida (shining).* *fl.* blue or white, disposed in spicate racemes; corolla campanulately rotate. Summer. *l.* in rosettes, leathery, very dark and shining green, oblong, crenated; cauline ones linear-lanceolate, almost entire. Stem simple. *h.* 3in. to 9in. North America, 1731. Borders. There are also double blue and white flowered forms of this species. SYN. *C. planiflora.*

C. nobilis (noble).* *fl.* drooping, crowded towards the ends of the branchlets; corollas reddish-violet, white, or cream-coloured, spotted, 3in. or more long. July. *l.* hairy; lower ones petiolate, ovate, toothed; upper ones lanceolate, nearly or quite sessile. *h.* 2ft. China, 1844. Borders. (B. R. 32, 65.) There is also a white-flowered variety.

C. patula (spreading). *fl.* panicled, terminal, and axillary, on long pedicels, large, erect; corollas blue or white, funnel-shaped. July. *l.*, radical ones crowded, obovate, crenated; cauline ones

Campanula—*continued.*

linear-lanceolate, sessile, nearly entire. Stems branched. Branches diverging. Europe. Borders. (Sy. En. B. 873.)

FIG. 347. FLOWERING BRANCH OF CAMPANULA MEDIUM.

C. peregrina (foreign).* *fl.* disposed in a dense spicate raceme, sessile; corollas of a dark violet colour at the base, not so deep in the middle, and paler towards the margins, funnel-shaped. July. *l.* crenated; lower ones obovate; superior ones ovate, acute. Stem simple, angular. *h.* 2ft. Mount Lebanon, 1794. Borders. (B. M. 1257.)

C. persicæfolia (Peach-leaved).* *fl.* terminal and axillary, pedunculate, solitary, inclined, racemose; corollas blue and all the intermediate shades to white, large, broadly campanulate. July. *l.* glabrous, stiff, crenulated; radical ones lanceolate-obovate; cauline ones linear-lanceolate. Stems nearly simple. *h.* 1ft. to 3ft. Britain. (Sy. En. B. 871.) The forms of *C. persicæfolia* are very numerous in gardens. The following are well worth growing: *alba*, pure white, single-flowered; *alba coronata*, pure white, semi-double; *alba fl.-pl.*, flowers very double and Camellia-like, constituting one of the best hardy flowers for cutting; *cærulea coronata*, blue, in form like the white; *cærulea fl.-pl.*, flowers semi-double.

C. phrygia (Phrygian). *fl.*, corolla bluish-violet, spreading, having the nerves more intensely coloured. July. *l.* ovate-lanceolate, crenated; lower ones obtuse, upper acute. Stem branched. Branches very naked, divaricate, each terminating in a single flower. *h.* 3in. to 6in. Mount Olympus, 1820. Rockery annual.

C. planiflora (flat-flowered). A synonym of *C. nitida.*

C. Portenschlagiana (Portenschlag's).* *fl.* light blue-purple, erect, or nearly so, bell-shaped, with spreading segments, several at the ends of the shoots, and one or two in the upper axils. June, July. *l.*, radical ones broadly reniform, conspicuously but irregularly toothed, on long slender petioles; cauline ones passing from reniform to ovate. *h.* 6in. to 9in. South Europe. Rockery. SYN. *C. muralis.* (B. R. 1995.)

C. primulæfolia (Primula-leaved). *fl.* disposed in a spicate raceme; corolla blue or purple, with a whitish downy bottom, campanulately rotate, nearly glabrous. July. *l.* unequally and doubly crenated; radical ones lanceolate, bluntish; cauline ones ovate-oblong, acute. Stem hispid, simple. *h.* 1ft. to 3ft. Portugal. Borders. (B. M. 4879.)

C. pulla (russet).* *fl.* terminal, large for the size of the plant; corollas violaceous-blue, campanulate. June. *l.* glabrous, crenulately toothed; lower ones on short petioles, ovate-roundish; superior ones sessile, ovate, acute. Stems rarely pilose at the base. *h.* 3in. to 6in. Eastern Europe, 1779. Rockery, in rich sandy peat and leaf soil. (L. B. C. 554.)

C. pumila (dwarf). A synonym of *C. pusilla.*

Campanula—*continued.*

FIG. 348. UPPER PORTION OF FLOWERING STEM OF CAMPANULA PUNCTATA.

C. punctata (dotted). *fl.* whitish, spotted with red on the inner surface; large, pendulous. *l.* ovate-acute, somewhat crenate. Stem simple, erect, few-flowered. *h.* 1½ft. Siberia, Japan, &c. Border perennial. See Fig. 348.

C. pusilla (small).* *fl.* axillary and terminal at the upper part of the slender stems, pendulous, bell-shaped, passing from deep blue to white. July, August. *l.*, radical ones tufted, broadly ovate or roundish, slightly cordate, obtusely serrated, on petioles longer than the laminæ; cauline ones linear-lanceolate, distinctly toothed, sessile. *h.* 4in. to 6in. Southern Europe. SYN. *C. pumila.* (B. M. 512.) There is a pale-coloured variety named *pallida*, and a pure white variety named *alba*, both of which, as well as the species, are most desirable for the embellishment of rockeries, or for planting in sandy soil as a front line for a border.

FIG. 349. CAMPANULA PYRAMIDALIS, showing Habit and Flower.

C. pyramidalis (pyramidal).* Chimney Bell-flower. *fl.* very numerous, pedicellate, usually three together from the same bract, the whole disposed in a large pyramidal raceme, which is loose at the base; corollas pale blue or white, with a dark base. July. *l.* glandularly toothed; lower ones petiolate, ovate-oblong, somewhat cordate; cauline ones sessile, ovate-lanceolate. Stem nearly simple, but furnished with floriferous branchlets. *h.* 4ft. to 5ft. Europe, 1596. See Figs. 349 and 350. There are several excellent varieties, but the light and dark blue and white are the best. Borders, and for pot culture.

C. Raineri (Rainer's).* *fl.* blue, erect; corolla turbinate. June. *l.* almost sessile, ovate, tomentose, remotely serrated; lower ones the smallest, obovate. Stems erect, firm, branched. Branches one-flowered, leafy. *h.* 2in. to 3in. Switzerland, Italy, &c., 1826.

Campanula—*continued.*

A beautiful little alpine, requiring a warm position in rich gritty soil; it must be religiously protected against slugs. (F. d. S. 1908.)

FIG. 350. FLOWERING BRANCH OF CAMPANULA PYRAMIDALIS.

C. ramosissima (much-branched). *fl.*, corolla with a white base; middle part or base of the lobes pale blue, and the lobes bluish-violet; peduncles long, naked, glabrous, bearing each an erect flower at the apex. June. *l.* sessile, glaucous; lower ones obovate, crenated; middle ones ovate-lanceolate; superior ones linear, entire. Stem branched. *h.* 6in. to 12in. South Europe, 1824. Annual. SYN. *C. Loreyi.* (B. M. 2581.)

C. r. flore-albo (white-flowered) only differs from the type in having white flowers.

FIG. 351. CAMPANULA RAPUNCULUS.

C. rapunculoides (Rapunculus-like).* *fl.* drooping, solitary, disposed in spike-formed racemes, secund, but usually hanging on all sides in strong garden specimens; corollas bluish-violet, funnel-shaped, and bearded a little inside. June. *l.* scabrous, ovate, acuminated; radical ones petiolate, cordate, crenulated; cauline ones serrulated. Stems glabrous or scabrous, usually branched in gardens, but simple in the wild state. *h.* 2ft. to 4ft. Europe. Borders. (Sy. En. B. 869.)

Campanula—*continued.*

C. r. trachelioides (Trachelium-like). Stem and leaves, but particularly the calyx, beset with stiff white hairs.

C. Rapunculus (little turnip).* Rampion. *fl.* nearly sessile, or pedicellate, erect, forming a long raceme, which is branched at the base; corolla blue or white, funnel-shaped. July. *l.*, lower ones obovate, on short petioles, nearly entire; cauline ones sessile, linear-lanceolate, entire. Stem simple, but sometimes furnished with a few branches towards the top. *h.* 2ft. to 3ft. Europe. Borders. See Fig. 351. (Sy. En. B. 872.)

C. rhomboidalis (rhomboidal). *fl.* usually drooping, few, disposed in loose racemes, pedunculate; corolla blue, campanulate. July. *l.* sessile, ovate, acute, serrate. Stem glabrous, or a little pilose, furnished with flower-bearing branches at top. *h.* 1ft. to 2ft. Europe, 1775. Border. SYN. *C. rhomboidea.* (L. B. C. 603.)

C. rhomboidea (diamond-leaved). A synonym of *C. rhomboidalis.*

C. rotundifolia (round-leaved).* Blue-bell; Hare-bell. *fl.* drooping, solitary, pedunculate, few on each stem; corolla deep blue, campanulate. June to August. *l.*, radical ones petiolate, cordate roundish, crenately toothed; cauline ones linear or lanceolate. Stems numerous. *h.* 6in. to 12in. Britain. (Sy. En. B. 870.)

C. r. alba (white).* *fl.* white, the same size as those of the type. Stems much more leafy.

C. r. Hostii (Host's).* *fl.* rich blue, much larger than those of the type, produced on stouter profusely branched stems. July, August. *l.*, radical ones roundish only in a very early state; cauline ones linear, acuminate, sometimes 3in. to 4in. long. SYN. *C. Hostii.* See Fig. 339. There is a white-flowered form of this, not quite so vigorous as the blue-flowered form, but the flowers are equal in size.

FIG. 352. FLOWERS OF CAMPANULA ROTUNDIFOLIA SOLDANELLÆFLORA.

C. r. soldanellæflora (Soldanella-flowered).* *fl.*, corolla blue, semi-double, turbinate, with shallow marginal divisions, very acutely pointed. June. *l.* long, linear, acute, sessile. Stem simple, slender. *h.* 1ft. 1870. (R. G. 473.) All the forms of *rotundifolia* are pretty, and suitable for the front of borders, or the rockery; rising from the crevices of the latter, with their slender stems laden with flowers, they are especially beautiful. See Fig. 352.

FIG. 353. FLOWERS AND LEAVES OF CAMPANULA SARMATICA.

Campanula—*continued.*

C. sarmatica (Sarmatian).* *fl.* nutant, usually secund, terminal and axillary, forming a long, loose, scattered raceme; corolla pale blue, velvety outside. July. *l.* tomentose; lower ones petiolate, cordate, rather hastate, crenately toothed; superior ones sessile, ovate-lanceolate, serrate-toothed. Stems simple, straight, downy. *h.* 1ft. to 2ft. Caucasus, 1803. Borders. (B. R. 237.) See Fig. 353.

C. saxatilis (rock). *fl.* three to five, disposed in a loose raceme; corolla blue, tubular, nutant. May. *l.* crenated; radical ones rosulate, somewhat spathulate; cauline ones ovate, acute. Stem erect. *h.* 6in. Crete, 1768. Rockery. Very rare.

C. Scheuchzeri (Scheuchzer's).* *fl.* dark blue, pendent, on slender stems, broadly bell-shaped. July, August. *l.*, lower ones similar to those of *C. pusilla*; upper ones linear. *h.* 3in. to 6in. South European Alps, 1813. (L. B. C. 485.)

C. Scouleri (Scouler's). *fl.* pale blue, paniculate, bell-shaped. July, August. *l.*, lower ones ovate, on long petioles, coarsely serrated; cauline ones ovate-lanceolate. *h.* 1ft. North-west America, 1876. Rockery.

C. sibirica (Siberian). *fl.* panicled, numerous, drooping; corollas bluish-violet, large. July. *l.* crenulated; radical ones crowded, petiolate, obovate, obtuse; cauline ones sessile, oblong-lanceolate, undulated, acuminated. Plant beset with bristle-like hairs. Stem branched. *h.* 1ft. to 1½ft. East Europe, 1783. Biennial. Borders. (B. M. 659.)

C. s. divergens (divergent).* *fl.* violaceous, rather large, at first erect, but drooping in the expanded state; peduncles many-flowered, and, like the stem, usually trichotomous. June. *l.*, radical ones sub-spathulate, crenulated, narrowed at the base; cauline ones sessile, lanceolate, acuminated. Plant pilose, panicled. *h.* 1½ft. Siberia, 1814. Biennial. SYN. *C. spathulata.* (S. B. F. G. ii., 256.)

C. spathulata (spathulate). A synonym of *C. sibirica divergens.*

C. speciosa (beautiful).* *fl.* pedicellate, disposed in a pyramidal raceme; corolla blue, purple or white, 1in. long, smooth outside, but often villous inside. June, July. *l.* sessile, repandly crenated; radical ones rosulate, linear-lanceolate; cauline ones linear. Stem simple. *h.* 12in. to 18in. South-west Europe, 1820. Borders. (B. M. 2649.)

C. spicata (spicate). *fl.* sessile, one to three from each bract; spike long, interrupted at the base; corolla blue, funnel-shaped. July. *l.* sessile, nearly entire; radical ones crowded, linear-lanceolate; cauline ones linear, acuminated. Stem simple. *h.* 1ft. to 2ft. Europe, 1786. Biennial. Borders. (A. F. P. 3, 46.)

C. stricta (strict). *fl.* almost sessile, few, solitary, spicate; corolla blue, tubular. July. *l.* ovate-lanceolate, acute, serrated, pilose. Stem branched, pilose. *h.* 1ft. to 2ft. Armenia, 1819. Biennial. Borders.

FIG. 354. CAMPANULA THYRSOIDEA, showing Entire Plant and Single Flower.

C. thyrsoidea (thyrsoid).* *fl.* disposed in a dense pyramidal spike, sessile; corolla sulphur-coloured, oblong. July. *l.* entire, pilose; lower ones lanceolate, obtuse; cauline ones linear-lanceolate, acute. Stem simple, covered with leaves and flowers. Plant pilose. *h.* 1ft. to 1½ft. Alps of Europe, 1785. Biennial. Rockery. (B. M. 1290.) See Fig. 354.

C. Tommasiniana (Tommasini's).* *fl.* pale blue, tubular, slightly angled, in closely set, several-flowered, axillary cymes. July, August. *l.* nearly or quite sessile, linear-lanceolate, acuminate, distinctly serrated, there being no difference between the lower and upper ones. Stems at first erect, ultimately drooping through the weight of the flowers. *h.* 9in. to 12in. Italy. A very handsome alpine species. (B. M. 6590.)

C. Trachelium (Throat-wort).* *fl.* drooping a little, one to four together, terminating the branchlets; corolla variously coloured,

Campanula—*continued.*

campanulate, bearded inside. July. *l.* scabrous, acuminated, coarsely and crenately toothed; radical ones petiolate, cordate. Stem angular, simple or branched. *h.* 2ft. to 3ft. Europe. Borders. (Sy. En. B. 867.) There are double blue, double white, and variously shaded single forms of this species.

C. trichocalycina (hairy-calyxed). *fl.* disposed in an almost simple terminal raceme, approximate at the top, one to three rising from each axil, at the time of flowering erect, but afterwards drooping; corolla profoundly five-cleft, funnel-shaped. July. *l.* on short petioles, ovate, acute, coarsely serrated. Stem simple. *h.* 1ft. to 3ft. Europe, 1823. Borders.

C. Van Houttei (Van Houtte's).* *fl.* dark blue, bell-shaped, pendulous, 2in. long, axillary and terminal. July, August. *l.*, lower ones roundish-cordate, crenate on long stalks; cauline ones oblong-lanceolate, sessile, serrated. *h.* 2ft. This is a very fine hybrid. Differing from it only in colour and other unimportant details is *C. Burghalti*, a handsome hybrid, found in gardens; the flowers are of a pale purple colour, very large, pendent. These are two of the best border Bell-flowers in cultivation.

C. versicolor (various-coloured). *fl.* disposed in long spicate racemes; corolla of a deep violaceous colour at bottom, pale in the middle, and the lobes pale violet, companulately rotate. July to September. *l.* serrated; radical ones petiolate, ovate, acute, rather cordate; cauline ones on short petioles, ovate-lanceolate, acuminated. Stems erect. *h.* 3ft. to 4ft. Greece, 1788. Borders. (S. F. G. 207.)

C. Vidalii (Vidal's). *fl.* large, racemose; corolla white, wax-like, between urceolate and campanulate, pendulous; disk singularly broad, surrounded by a thick bright orange-coloured annulus. July and August. *l.* thick and fleshy, oblong spathulate, viscid, coarsely serrated. *h.* 1ft. to 2ft. Azores, 1851. Perennial. Cool greenhouse or (during summer) herbaceous border. (B. M. 4748.)

FIG. 355. CAMPANULA WALDSTEINIANA.

C. Waldsteiniana (Waldstein's).* *fl.* three to four at the top of each stem, one of which is termina, and the others from the axils of the superior leaves, always looking upwards; corollas violaceous-blue, campanulate. June. *l.* greyish, sessile, lanceolate, serrated; lower ones obtuse; superior ones long-acuminated. Stems erect, flexuous, stiff, simple, numerous from the same root. *h.* 4in. to 6in. Hungary, 1824. See Fig. 355.

C. Wanneri (Wanner's). A synonym of *Symphyandra Wanneri.*

C. Zoysii (Zoys's).* *fl.* pedicellate, drooping; corolla pale blue, with five deeper-coloured lines, cylindrical, elongated. June. *l.* entire; radical ones crowded, petiolate, ovately obovate, obtuse; cauline ones obovate-lanceolate, and linear. Plant small, tufted. *h.* 3in. Carniola, 1813. A scarce little alpine gem, thriving in a sunny chink in rich gritty soil.

CAMPANULACEÆ. A large order of herbs or sub-shrubs. Flowers blue or white; corolla regular, bell-shaped, usually five-lobed. Leaves alternate, exstipulate. The genus best known is *Campanula*; other genera are *Adenophora*, *Jasione*, and *Phyteuma.*

CAMPANULATE. Bell-shaped.

CAMPANUMÆA (altered from *Campanula*). ORD. *Campanulaceæ.* A genus of greenhouse herbaceous, tuberous-rooted, twining perennials. Flowers involucrated, solitary, on axillary and terminal peduncles. Leaves opposite, petiolate, glaucescent beneath. Stems and branches terete. They thrive best in a rich sandy loam, with a little peat. Propagated by seeds and divisions.

Campanumæa—*continued.*

C. gracilis (graceful). *fl.* pale blue; corolla membranous, with a tubular base, dilated throat, and slightly expanded, truncated limb. *l.* on long petioles, ovate, blunt. Himalayas. SYN. *Codonopsis gracilis.* (C. H. P. t. xvi. A.)

C. inflata (inflated.) *fl.* yellowish, with brownish veins; corolla herbaceous, ventricose; peduncles opposite the leaves, one-flowered. *l.* alternate, ovate-cordate, acute. Himalayas. (C. H. P. t. xvi. C.)

C. javanica (Javan). *fl.* yellowish, with brownish veins; corolla herbaceous, very broadly campanulate, with five spreading lobes. *l.* variable, opposite and alternate, ovate-cordate, crenate. Himalayas. (C. H. P. t. xvi. B.)

CAMPEACHY WOOD, or **LOGWOOD.** *See* **Hæmatoxylon campechianum.**

CAMPHORA (Camphor, commercial name of its chief product). Camphor-tree. ORD. *Laurineæ.* Cool stove evergreen trees, now referred to *Cinnamomum.* The true Camphor of commerce is a product of the oil procured from the wood, branches, and leaves of this tree, by means of dry distillation. The species thrives in a compost of peat and loam, and may be propagated by cuttings.

C. officinalis (officinal). *fl.* greenish-white. March to June. *l.* triple-nerved, lanceolate, ovate. *h.* 20ft. Japan, 1727. SYN. *Cinnamomum Camphora.*

CAMPHOR-TREE. *See* **Camphora.**

CAMPION. *See* **Silene.**

CAMPION, MOSS. *See* **Silene acaulis.**

CAMPION, ROSE. *See* **Lychnis.**

CAPSIDIUM (from *kampsis,* a curving). ORD. *Bignoniaceæ.* A small genus, the best-known (perhaps the only) species being a handsome greenhouse climber. For culture, *see* **Bignonia.**

C. chilense (Chilian). Pipil Boqui. *fl.* rich orange colour; corolla tubular, almost regular; anthers parallel. *l.* pinnate, dark shining green. *h.* 30ft. to 40ft. Chili. (G. C. 1870, 1182.)

CAMPTERIA. Included under **Pteris** (which *see*).

CAMPTODIUM. *See* **Nephrodium.**

CAMPTOPUS (from *kamptos,* curved, and *pous,* a foot; the flower-stalk is curved downwardly). ORD. *Rubiaceæ.* A curious shrub, now referred to *Cephaelis.* It requires a most stove temperature. Cuttings will root in sandy loam, under a hand glass, in bottom heat.

C. Mannii (Mann's). *fl.* white, numerously produced in subglobose, compound heads; peduncles stout, scarlet, drooping, from 12in. to 18in. long. Summer. *l.* large, opposite, obovate or obovate-lanceolate, glabrous, coriaceous; midrib thick, red beneath. *h.* 15ft. Fernando Po, 1863. (B. M. 5755.)

CAMPTOSORUS. *See* **Scolopendrium.**

CAMPYLANTHERA. A synonym of **Pronaya.**

CAMPYLIA. Included under **Pelargonium.**

CAMPYLOBOTRYS. *See* **Hoffmannia.**

CAMPYLONEURON. *See* **Polypodium.**

CAMWOOD. *See* **Baphia.**

CANADA BALSAM. *See* **Abies balsamea.**

CANADA RICE. *See* **Zizania aquatica.**

CANADA TEA. *See* **Gaultheria procumbens.**

CANALICULATE. Channelled, or furrowed.

CANARINA (so named from its habitat). SYN. *Pernettya* (of Scopoli). ORD. *Campanulaceæ.* A beautiful, glaucescent, greenhouse, herbaceous perennial. It thrives in a compost of loam, leaf mould, thoroughly decomposed manure, and sand, in equal parts; ample root space and perfect drainage are essential, and when new growth commences, a little extra heat will considerably accelerate the development of the flowers. Water should be liberally supplied during the growing season. The plant may be propagated by divisions when repotting, in January; or by young cuttings, inserted in sandy soil, in a gentle warmth.

C. Campanula (bell-shaped).* *fl.* of a yellowish-purple or orange colour, with red nerves, drooping, solitary, terminating axillary branchlets; corolla six-lobed at the apex, large, campanulate. January to March. *l.* opposite, hastately sub-cordate, irregularly toothed. *h.* 3ft. to 4ft. Canary Islands, 1696. (B. M. 444.)

CANARIUM (from *Canari,* its vernacular name in the Malay language). ORD. *Burseraceæ.* A rather large genus of stove trees. Flowers small, in axillary panicles; petals usually three, valvate, or slightly imbricate in the bud. Drupe ovoid or ellipsoid, often three-angled. Leaves large, impari-pinnate. For culture, *see* **Boswellia.**

C. commune (common). *fl.* white, glomerate, nearly sessile, bracteate; panicle terminal. *l.*, leaflets seven to nine, on long stalks, ovate-oblong, bluntly acuminated, entire. India. The fruit has a thin olive skin, and when the nuts are mature, they contain a sweet kernel, which does not become rancid, and resembles a Sweet Chestnut; they are also used for various economic purposes. (B. M. Pl. 61.)

CANARY-BIRD FLOWER. *See* **Tropæolum peregrinum.**

CANAVALIA (from *Canavali,* the name of one of the species in Malabar). ORD. *Leguminosæ.* A genus of elegant twining or climbing stove herbs or subshrubs. Flowers in racemes, produced from the axils of the leaves; calyx bell-shaped, two-lipped; corolla papilionaceous. Leaves trifoliate. They are well adapted for training up the rafters in a stove or warm greenhouse. For culture, *see* **Dolichos.**

C. bonariensis (Buenos Ayre). *fl.* purple; racemes drooping, longer than the leaves. July and August. *l.*, leaflets ovate, obtuse, coriaceous, glabrous. Buenos Ayres, 1824. (B. R. 1199.)

C. ensiformis (ensiform).* *fl.* white, red, pendulous; racemes longer than the leaves. June. *l.*, leaflets ovate, acute. India, 1790. SYN. *C. gladiata.* (B. M. 4027.)

C. gladiata (sword-podded). Synonymous with *C. ensiformis.*

C. obtusifolia (obtuse-leaved). *fl.* purple. July, August. *l.*, leaflets ovate obtuse. Malabar, 1820.

CANBIA (named in honour of W. M. Canby, of Wilmington, Delaware). ORD. *Papaveraceæ.* A monotypic genus, remarkable for its persistent (not caducous) corolla. Sepals three, caducous; petals six, barely ½in. in length stamens six to nine.

FIG. 356. CANBIA CANDIDA.

B. candida (glossy white). *fl.* white, solitary, on little scapes. *l.* alternate, linear, entire. *h.* about 1in. Discovered in sandy soil in South-east California, in 1876. See Fig. 356.

CANCELLATE. Latticed; resembling lattice-work.

CANDELABRUM or **CHANDELIER TREE.** *See* **Pandanus candelabrum.**

CANDLEBERRY MYRTLE. *See* **Myrica cerifera.**

CANDLEBERRY-TREE. *See* **Aleurites triloba.**

CANDLE-TREE. *See* **Parmentiera cerifera.**

CANDOLLEA (named after Augustus Pyramus De Candolle, formerly Professor of Botany, at Geneva, and author of numerous botanical works). ORD. *Dilleniaceæ*. A genus of very ornamental greenhouse evergreen shrubs, natives of Australia. Flowers yellow, sub-solitary, at the tips of the branches; sepals five, oval, mucronate; petals obovate or obcordate. They thrive in a compost of equal parts loam and peat, with which sufficient sand may be mixed to render the whole porous. Cuttings will root, if placed in a similar compost, under a hand glass; seeds are also sometimes obtainable.

FIG. 357. FLOWERS AND BUDS OF CANDOLLEA CUNEIFORMIS.

C. cuneiformis (wedge-shaped).* *fl.* yellow. July. *l.* smooth, obovately cuneated, blunt at the top, entire. Branches cinerous. *h.* 7ft. 1824. See Fig. 357. (B. M. 2711.)

C. Huegelii (Huegel's). *fl.* at tops of the branches, among the leaves, on short pedicels; sepals acuminate, hoary outside, longer than the petals. May. *l.* linear, quite entire, villous when young. *h.* 6ft. 1837.

C. tetrandra (four-stamened). *fl.* yellow, solitary; petals emarginate. June. *l.* oblong, cuneate, toothed. *h.* 7ft 1842. (B. R. 1843, 50.)

CANDYTUFT. *See* **Iberis.**

CANE-BRAKE. A common name for different species of *Arundinaria*.

CANELLA (a diminutive of *canna*, a reed; in allusion to the rolled bark, like cinnamon). ORD. *Canellaceæ*. The best-known species of this genus is a very ornamental and economically valuable stove evergreen tree, which thrives in a mixture of loam and sand. Well-ripened cuttings, taken off at a joint, will root in sand, under a hand glass, with bottom heat, in April or May; but care should be taken not to deprive them of any of their leaves. Sweet says that large old cuttings are best.

C. alba (white).* *fl.* violet-colour, small, growing at the tops of branches in cluster, but upon divided peduncles. *l.* alternate, obovate, cuneated at the base, white, or glaucous beneath, somewhat coriaceous, sometimes full of pellucid dots. *h.* 15ft. The whole tree is very aromatic, and, when in blossom, perfumes the neighbourhood. The flowers dried, and softened again in warm water, have a fragrant odour, nearly approaching to that of Musk. The leaves have a strong smell of Laurel. West Indies, &c., 1735. (T. L. S. i., 8.)

CANELLACEÆ. A small order of tropical American aromatic shrubs, allied to *Bixineæ*, from which it differs only in having the albumen firmer, and with a smaller embryo. The genera are *Canella* and *Cinnamodendron*.

CANESCENT. Hoary, approaching to white.

CANICIDIA. A synonym of **Rourea** (which *see*).

CANISTRUM (from *canistrum*, a basket; in allusion to the inflorescence resembling a basket of flowers). ORD. *Bromeliaceæ*. Stove epiphytes, with showy inflorescence, and requiring similar culture to **Billbergia** (which *see*).

C. aurantiacum (orange).* *fl.* orange-yellow, in a cup-shaped involucre of orange-red bracts; scapes erect. June to September. *l.* ligulate-lorate denticulate, deflexed. Brazil, 1873. See Fig. 358. (B. H. 1873, 15.)

Canistrum—*continued.*

FIG. 358. CANISTRUM AURANTIACUM.

C. eburneum (ivory).* *fl.* white, green, disposed in a depressed head, the white ovaries of which give an appearance as of eggs in a basket. May. *l.* tufted, mottled, the central ones cream-coloured, surrounding the flower-heads. *h.* 2ft. SYNS. *Guzmannia fragrans* and *Nidularium Lindeni*. Brazil, 1876. (B. H. 1879, 13, 14.)

C. roseum (rose-coloured). *fl.* white, green; bracts rosy. 1879.

C. viride (green). *fl.* green. *l.* green, canaliculate, acuminate, irregularly toothed. Brazil, 1875. SYN. *Nidularium latifolium*. (B. H. 1874, 16.)

CANKER. This is a disease presenting very serious difficulties, principally in the cultivation of Apples and Pears. Both the trees and fruits, especially of some varieties, are, in many localities, so far injured as not to be worth cultivating. What causes the disease is not at all times known; indeed, it is, in most cases, but imperfectly understood. Were the causes better known, the remedy might generally be much easier found. Some of the primary causes are cold and undrained soil, severe and careless pruning, extreme variations of temperature, and excessive growth, made late in the season, when it has not sufficient time to get well ripened. Trees that are badly Cankered may often be improved by lifting, and replanting in improved or better-drained soil. Immediately the disease is detected in young trees, by the cracking of the bark or the skin of the fruits, measures should be taken to find the cause, if possible, and avert its progress. Some Pear-trees, in various localities, will not produce fruit without Canker in the open garden, but they will do so when planted against a wall; and as such may be the very best varieties, trees should be placed in the latter position. The removal of large branches, late in spring, will sometimes produce Canker, at the point where mutilation has taken place; and it may be caused by severe late pruning, which induces the growth of soft shoots that are almost certain to be injured by severe frosts. The difference in the seasons, as regards the amount of moisture, is one that can scarcely be provided against. One spring may be favourable to rapid growth, and the following may be most unfavourable, thereby arresting the natural flow of the sap until the latter part of the summer, when excessive growth will probably take place. Such checks invariably produce Canker. At times, the disease seems caused by the punctures of insects, in an early stage, on the stems or branches. In such instances, a thorough

Canker—*continued.*

cleansing, and a smearing of quicklime, made into a wash, often proves successful. Strong tobacco water will destroy insects, and a weak solution of sulphuric acid is also fatal to lichens and mosses, which should never be allowed to obtain a footing. The chief preventatives, therefore, are: Planting in well-drained soil; avoiding the use of any rank manure, to cause excessive growth; changing the old, or adding new, soil to injured trees; careful pruning, and the encouragement of early growth in spring, and subsequent well ripening in autumn.

CANNA (derivation uncertain; according to some, from *cana*, the Celtic name for cane, or reed). Indian Shot. ORD. *Scitamineæ*. A large genus of stove herbaceous perennials, very extensively employed in sub-tropical and other methods of summer gardening. Flowers spathaceous; anther attached to the edge of the petal-like filament. Leaves very ornamental. Few plants are more easily

Canna—*continued.*

a capital mixture for them. The plants must be kept in a growing temperature of 60deg. or so, during their earlier stages, and shifted as required into larger pots. Under proper management, the roots will fill 6in. pots by the middle or end of May. They ought not to be planted out till the end of May or the first week in June. Should fairly rich soil and a sheltered place be selected for them, they will not only grow, but flower freely during the late summer and autumn months. Cannas are also very effective indoors, either for greenhouse or room decoration. For these purposes they may be grown on in 8in., 10in., or even 12in., pots, with rich soil, and placed either in a stove, intermediate house, warm or cool conservatory, window, or room. Liberal supplies of manure water will be of very great benefit. Propagation is also effected by means of divisions; they form a root-stock very like some of the commoner and more free-growing Irises, each portion of

FIG. 359. CANNA INDICA, showing Habit, Flowers, and Leaves.

grown, or more quickly propagated. Seeds of many of the finer sorts may be bought cheaply from respectable seedsmen. These should be sown in heat, in February or March. A warm house or cucumber pit is the best place for sowing the seeds, which are very hard. If soaked in tepid water for twenty-four hours, germination will be materially stimulated. A mixture of sand and leaf mould is best for them, and a covering of 1½in. or 2in. of earth is not excessive. They should be sown thinly, in pans. As Cannas are gross, and have somewhat brittle roots in a young state, it is a good plan to sow the seed singly in small pots. This method preserves all the roots intact, and prevents any check in potting off or dividing the plants out of seed pans or boxes. When this is not done, the plants must be potted off singly, as soon as they have formed two leaves, 3in. pots being used for the first shift. The soil can hardly be too rich and porous. Equal parts rotted dung, loam, and sand, with a little peat, form

which, with bud and roots attached, may be converted into an independent plant. The best mode of procedure is to divide the rootstock in early spring, when the pieces may be placed in 4in. pots at once; and, if plunged in a bottom heat of 60deg. or so, they will quickly resume root action and grow rapidly. They may also be propagated by division without bottom heat. Those who grow large quantities seldom put their plants in pots at all. Stored in pots or boxes for the winter, they are divided and placed singly in similar positions in the spring, and transferred from such vessels into the open air. The best open site for Cannas is in a sheltered spot, with a good depth of rich soil, and plenty of moisture. In such a position, their noble leaves are not so much injured by rough winds. After flowering, or at the end of the season, they may be lifted and stored away in boxes, or in pots of earth, in dry, frost-proof sheds, or under greenhouse stages during winter. In warm, sheltered situations, with dry

Canna—*continued.*

bottoms, they winter safely in the open, provided their crowns are covered with 1ft. of litter or cocoa fibre refuse. But where the soil is wet and cold, or the situation bleak and unprotected, they should be lifted and stored away, as already described.

C. Achiras variegata (variegated Achiras).* *fl.* dark red. August. *l.* bright green, striped with white and yellow. Better adapted for indoor culture than out.

C. Annæi (M. Année's).* *fl.* salmon-colour, large, well formed. June. *l.* large, green, glaucescent, ovate-acute, 2ft. long by 10in. wide. Stems vigorous, stiff, sea-green. *h.* 6ft. (R. H. 1861, 470.) Of this there are many forms, the best of which are:

C. A. discolor (two-coloured).* *fl.* rosy-yellow, few, small. Late summer. *l.* lanceolate, erect, light red, 2½ft. long, 10in. wide. Stems dark red. *h.* 3ft. to 5ft.

C. A. fulgida (red).* *fl.* orange-red, large, well-opened. *l.* 20in. long, 6in. wide, deep purple, erect. Stems small, dark red. *h.* 3ft. to 5ft.

C. A. rosea (rose).* *fl.* carmine-rose colour, small, few. Late summer. *l.* 2ft. long, very narrow, pointed, erect. Stems dark green, with a reddish base, numerous. *h.* 5ft.

C. Auguste Ferrier (A. Ferrier's).* *fl.* orange-red, medium-sized. *l.* very large, oval, erect, pointed, deep green, with narrow stripes and margins of dark purplish-red. Stem green, very thick, downy. *h.* 10ft.

C. aurantiaca (orange). *fl.*, segments of perianth rose-coloured outside, reddish inside; upper lip orange, lower one yellow, dotted with orange. *l.* large, broadly lanceolate, pale green; margins slightly undulated. *h.* 6½ft. Brazil, 1824.

C. Bihorelli (Bihorell's).* *fl.* deep crimson, produced upon branching spikes in great abundance. *l.* red when young, changing to deep bronze with age. *h.* 6ft. to 7ft. One of the best.

C. Daniel Hooibrenk. *fl.* bright orange, large, freely produced, *l.* large, glaucous-green, acuminate, with bronzy margin. Stalks strong, green. *h.* 6ft.

C. Depute Henon.* *fl.* pure canary-colour, with a yellowish base, large; spikes numerous, rising gracefully above the foliage to a height of 1½ft. *l.* ovate-acute, erect. *h.* 4ft.

C. discolor (two-coloured).* *fl.* red. *l.* very large, broad, ovate-oblong; lower ones tinged with a blood-red hue; upper ones streaked with purple. Stems stout, reddish. *h.* 6ft. South America, 1872. (B. R. 1231.)

C. edulis (edible). *fl.* large, with purple outer segments, inner ones yellowish. *l.* broadly ovate-lanceolate, green, tinged with maroon. Stems deep purple tinged. *h.* 6ft. to 7ft. Peru, 1820. (B. R. 775.)

C. expansa-rubra (red-expanded).* *fl.* large, with rounded bright purple segments. *l.* very large, sometimes over 4ft. long, and nearly 2ft. broad, ovate, obtuse, spreading horizontally, dark red. Stems numerous, very thick. *h.* 4ft. to 6ft.

C. flaccida (flaccid). *fl.* yellow, very large, not very unlike those of the native *Iris pseudo-acorus*. *l.* ovate-lanceolate, erect. *h.* 2½ft. South America, 1788. (L. B. C. 562.)

C. gigantea (gigantic).* *fl.* large, very ornamental, with orange-red outer, and deep purple red inner segments. Summer. *l.* about 2ft. long; petioles covered with a velvety down. *h.* 6ft. South America, 1788. (B. R. 206.)

C. indica (Indian).* Indian Reed. *fl.* rather large, irregular; spikes erect, with light yellow and carmine-red divisions. Summer. *l.* large, alternate, ovate-lanceolate. *h.* 3ft. to 6ft. West Indies, 1570. See Fig. 359. (B. M. 454.)

C. insignis (magnificent). *fl.* orange-red, few, small. *l.* ovate, spreading horizontally, green, rayed and margined with purplish-red. Stems violet, downy. *h.* 3ft. to 5ft.

C. iridiflora (Iris-flowered). *fl.* rose, with a yellow spot on the lip; spikes slightly drooping, several emanating from the same spathe. Summer. *l.* broadly ovate-acuminate. *h.* 6ft. to 8ft. Peru, 1816. (B. R. 609.)

C. i. hybrida (hybrid). *fl.* blood-red, very large, only properly developed when grown in a greenhouse. *l.* green, very large. Stem green, downy, somewhat reddish. *h.* 6ft. to 8ft.

C. limbata (bordered).* *fl.* yellowish-red, disposed in long loose spikes; spathes glaucous. *l.* oblong-lanceolate, acute. *h.* 3ft. Native country uncertain, 1818. (B. R. 771.)

C. l. major (larger-bordered). *fl.* orange-red, large. *l.* large, lanceolate, 2½ft. long, 8in. wide, spreading, deep green. Stems downy. *h.* 5ft. to 6½ft.

C. nigricans (blackish).* *l.* coppery-red, lanceolate, acuminate, erect, 2½ft. long, 10in. to 12in. broad. Stems purplish-red. *h.* 4½ft. to 8ft. One of the finest kinds. *C. atro-nigricans* has leaves of a purplish shade, passing into dark red, of a deeper hue than those of *C. nigricans*.

C. Premices de Nice. *fl.* bright yellow, very large. Stems and leaves like those of *C. Annæi*.

C. Rendatleri (Rendatler's).* *fl.* salmon-red, numerous, large. *l.* much pointed, deep green, tinged with dark red. Stems purplish-red. *h.* 6ft. to 8ft.

Canna—*continued.*

FIG. 360. FLOWERING SPIKE OF CANNA SPECIOSA.

C. speciosa (showy).* *fl.* sessile, in pairs; petals two, erect, bifid; lip spotted, revolute. August. *l.* lanceolate. *h.* 3ft. Nepaul, 1820. See Fig. 360. (B. M. 2317.)

C. Van-Houttei (Van Houtte's).* *fl.* bright scarlet, large, very abundantly produced. *l.* lanceolate, 2ft. to 2½ft. long, acuminated, green, rayed and margined with dark purplish-red.

C. Warscewiczii (Warscewicz's).* *fl.* with brilliant scarlet inner, and purplish outer segments. *l.* ovate-elliptic, narrowed at both ends, deeply tinged with dark purple. *h.* 3ft. Costa Rica, 1849. (B. H. 2, 48.) There are several varieties of this species, the best two are: *Chatei*, with very large dark red leaves, and *nobilis*, with deep green leaves, rayed and margined with dark red.

C. zebrina (zebra-striped).* *fl.* orange, small. *l.* very large, ovate, erect, deep green, passing into dark red, rayed with violet-purple. Stems dark violet-red. *h.* 6ft. to 8ft.

CANNABINACEÆ. This order, of which the genus *Cannabis* (Hemp) is the type, is now merged into *Urticaceæ*.

CANNABIS (from the Greek word *kannabis*, used by Dioscorides, and that from Sanskrit *canam*). Hemp. ORD. *Urticaceæ*. A small genus, of but little ornamental value. Flowers racemose, diœcious. Nut two-valved, within the closed calyx. The undermentioned species is a hardy annual, of easy culture in ordinary garden soil. Propagated by seeds, sown in spring.

C. sativa (cultivated). *fl.* greenish. June. *l.* on long stalks; leaflets from five to seven, long, lanceolate, acuminated; margins serrated. *h.* 4ft. to 10ft., or even 20ft. India, &c. This plant is cultivated very extensively for the sake of its valuable fibre. Well-grown plants have rather an ornamental appearance during the summer months. See Fig. 361.

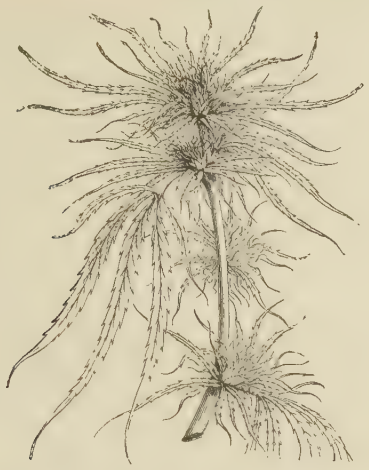


FIG. 361. HEAD OF CANNABIS SATIVA.

CANNON-BALL TREE. A common name for **Couroupita guianensis** (which *see*).

CANSCORA (from *Kansgan-Cora*, the Malabar name of *C. perfoliata*, as yet unintroduced). SYN. *Pladera.* Including *Phyllocyclus.* ORD. *Gentianeæ.* Small, erect, simple or branched, stove or greenhouse annuals. Flowers stalked or sub-sessile. Leaves opposite, sessile or amplexicaul. Corolla funnel-shaped, with a four-cleft, unequal limb; the two outer segments equal, two lower ones combined a greater distance. Stems tetragonal. *C. Parishii* requires similar treatment to **Balsam,** and grows best in a soil to which chalk or limestone débris is added.

C. Parishii (Parish's). *fl.* white. *l.* opposite, perfectly connate, so that the united two apparently form an exactly orbicular leaf. *h.* 2ft. Moulmein, 1864. Greenhouse. (B. M. 5429.)

CANTERBURY BELLS. *See* **Campanula Medium.**

CANTHARELLUS CIBARIUS. *See* **Chantarelle.**

CANTHIUM. A synonym of **Plectronia.**

CANTUA (from *Cantu*, the Peruvian name of one of the species). SYN. *Periphragmos.* ORD. *Polemoniaceæ.* Very pretty erect, branched greenhouse evergreen shrubs. Flowers in corymbs, at the termination of the branches, rarely solitary and axillary. Leaves entire or almost pinnatifid, alternate, petiolate, elliptic, acuminated, or cuneate-oblong, glabrous, or downy on both surfaces when young. They are of easy culture in a compost of turfy loam, leaf-mould, and sand, if good drainage is allowed. Propagated by cuttings, placed in sand, under a hand glass. In the western parts of England, these plants—particularly *C. buxifolia*—thrive remarkably well in sheltered situations.

C. bicolor (two-coloured). *fl.* solitary; corolla with a short yellow tube and scarlet limb. May. *h.* 4ft. Peru, 1846. (B. M. 4729.)

C. buxifolia (Box-leaved).* *fl.*, corolla pale red, straight, funnel-shaped, with a very long tube; corymbs few-flowered; peduncles tomentose. April. *l.* cuneate-oblong, mucronulate, quite entire. *h.* 4ft. Peruvian Andes, 1849. An elegant plant, having the tops of branches, calyces, and young leaves, downy. SYN. *C. dependens.* See Fig. 362. (B. M. 4582.)

C. dependens (hanging). Synonymous with *C. buxifolia.*

C. pyrifolia (Pyrus-leaved).* *fl.*, corolla yellowish-white, curved; stamens twice as long as the corolla; corymbs terminal, dense-flowered. March. *l.* elliptic or obovate acute, entire or sinuate-dentate. *h.* 3ft. Peru, 1846. (B. M. 4386.)

CAOUTCHOUC. The elastic gummy substance known as indiarubber, which is the inspissated juice of various plants growing in tropical climates in different parts of the world; such as *Castilloa, Ficus elastica, Hevea,* various species of *Landolphia, Manihot,* &c., &c.

CAPE EVERLASTING. *See* **Helichrysum.**

CAPE GOOSEBERRY. *See* **Physalis peruviana.**

FIG. 362. FLOWERING BRANCH OF CANTUA BUXIFOLIA.

CAPE GUM. The gum of *Acacia Karroo* or *A. capensis.*

CAPE JESSAMINE. *See* **Gardenia florida.**

CAPER-TREE. *See* **Capparis.**

CAPILLARY. Very slender; resembling a hair.

CAPITATE. Growing in a head.

CAPITULATE. Growing in small heads.

CAPITULUM. A close head of flowers; the inflorescence of Composites.

CAPPARIDEÆ. An order of herbs or shrubs, rarely trees. Flowers clustered, or solitary; sepals four to eight, imbricate or valvate; petals four, arranged crosswise, sometimes, but rarely, five, or eight, rarely absent. Leaves alternate, very rarely opposite, stipulate or exstipulate. The order is distributed throughout the tropical and warm temperate regions of both hemispheres, the frutescent species being largely represented in America. There are about twenty-three genera—the best-known being *Capparis, Cleome,* and *Cratæva*—and about 300 species.

CAPPARIS (*kapparis,* old Greek name used by Dioscorides, from Persian *kabar,* Capers). Caper-tree. ORD. *Capparideæ.* Greenhouse or stove evergreen shrubs, of considerable beauty. Calyx four-parted; petals four; stamens numerous; succeeded by a berry. They thrive best in a compost of well-drained sandy loam. Cuttings of ripe shoots will root in sand, under a hand glass, in moist heat. This genus contains about 120 species, but it is very doubtful if more than six are to be found under cultivation in this country.

C. amygdalina (Almond-like).* *fl.* white; peduncles axillary, compressed, corymbiferous. *l.* elliptical-oblong, narrowed towards both ends, with a callous point; upper surface smooth; under surface, as well as the branches, covered with silvery scaly dots. *h.* 6ft. West Indies, 1818. Stove.

C. cynophallophora (Dog-phallus bearing). *fl.* white, large, fragrant; peduncles few-flowered, shorter than the leaves. *l.* smooth, leathery, oblong, on short petiole. *h.* 8ft. to 25ft. West Indies, 1752. Stove. (R. G. 1862, 351.)

C. odoratissima (sweetest-scented).* *fl.* violet, sweet-scented, about the size of Myrtle, with yellow anthers; peduncles racemiferous at the top. *l.* oblong, acuminate, on long footstalks; upper surface smooth; under surface covered with little hard scales. *h.* 6ft. Caraccas, 1814. Stove.

Capparis—*continued.*

FIG. 363. FLOWER AND BUD OF CAPPARIS SPINOSA.

C. spinosa (spiny).* Common Caper. *fl.* white, tinged with red on the outside; pedicels solitary, one-flowered. June. *l.* ovate, roundish, deciduous. *h.* 3ft. South Europe, 1596. This is an excellent greenhouse shrub, and one which we have found perfectly hardy in the southern counties of England. See Fig. 363. (B. M. 291.)

CAPRIFOLIACEÆ. A rather large order of shrubs or herbs, often twining. Flowers terminal, corymbose, or axillary; corolla superior, regular or irregular. Leaves opposite, exstipulate. Well-known genera are: *Linnæa, Lonicera, Sambucus,* and *Viburnum.*

CAPRIFOLIUM. *See* **Lonicera.**

CAPSICUM (from *kapto,* to bite; on account of the biting heat of the seeds and pericarp). ORD. *Solanaceæ.* Shrubs or sub-shrubs, rarely herbs. Peduncles extra-axillary, one-flowered. Leaves scattered, solitary, or twin, and quite entire. Many of the species, although possessing considerable beauty, are but rarely grown, either for decoration or for the use of their fruit; consequently, we confine our specific enumeration to the Common Capsicum, the Bird Pepper or Chili, and the Bell Pepper. The first two of these have long been in cultivation, for use either in a green state for pickles and for making Chili vinegar, or ripened and ground as Cayenne Pepper. Some sorts are exceedingly ornamental for greenhouse decoration in winter, if plants are well grown in rather small pots, and the fruit ripened under glass. The varieties producing small pods are the hottest, and consequently best suited for making Cayenne Pepper. These are generally called

FIG. 364. FRUIT OF LONG AND ROUND CAPSICUMS.

Chilies. All other varieties of Capsicum have a more or less pungent flavour, and those bearing larger pods are more profitable for use in a green state. The fruits of all are either red or yellow when ripe, and are of various sizes and shapes. Some are produced and stand erect on the upper side of the branches; others hang underneath.

Capsicum—*continued.*

Fig. 364 represents hanging fruits of Long and Round Capsicums, the shapes of which are produced by both red and yellow varieties.

Cultivation. Being natives of tropical countries, Capsicums cannot always be depended upon to thoroughly ripen in the open air; but a good crop of green fruits may generally be obtained by preparing the plants early in the season, and planting out in a warm situation.

Sow the seeds in February or early in March, in pots or pans, placing them in heat; and so soon as the plants are large enough, pot off singly into 3in. pots, still keeping them in heat until well rooted. Place them into 6in. or 7in. pots before they become starved; and gradually harden off and plant out about 2ft. asunder, in June. The fruits ripen better if the plants are placed against a south wall and tacked on to it. The safest plan to obtain a crop of ripe fruits is to cultivate under glass. Pots of 7in. diameter are large enough. Rich soil must be used, and any spare frames are suitable in summer. Plenty of water and frequent syringings should be applied, as the plants are very liable to injury from red spider and other insects if this is in any way neglected. The fruits will keep some time after being ripe, but are never better than when fresh gathered; they may, however, be kept on the plants for a considerable period.

Sorts. Chili, Long Red, Long Yellow, Small Red Cayenne, Round Red, and Round Yellow. Good ornamental varieties are: Little Gem, a very dwarf variety, of comparatively recent introduction, covered with small, erect, red pods; and Prince of Wales, free fruiting, with hanging bright yellow pods.

C. annuum (annual). Common Capsicum. *fl.* white, solitary. June. Petioles glabrous. *fr.* oblong, pendulous, and erect, red or yellow, variable in shape. *h.* 1ft. to 2ft. South America, 1548.

C. baccatum. Bird Pepper or Chili. *fl.* greenish; peduncles twin. June. *fr.* small, erect, almost globose. *l.* oblong, glabrous, as well as the petiole. Branches angular, striated. *h.* 2ft. to 4ft. Tropical America, 1731. Greenhouse shrub.

C. grossum (large). Bell Pepper. *fl.* white. July. India, 1759.

CAPSULAR. Like a capsule.

CAPSULE. A dry dehiscent seed vessel or fruit.

CARAGANA (*Caragan* is the name of *C. arborescens* among the Monguls). Siberian Pea-tree. ORD. *Leguminosæ.* Very ornamental hardy deciduous trees or shrubs. Flowers usually yellow, axillary, either solitary or crowded, but always single on thin stalks. Leaves abruptly pinnate, the midrib ending in a bristle or spine; leaflets mucronate. They are well adapted for shrubberies, and are of the easiest culture in sandy soil. Propagated by cuttings, made of the roots, or by seeds; the low-growing shrubs by seeds and layers. Caraganas are generally increased by grafting on *C. arborescens,* which is easily raised from seed, sown when ripe or in spring.

C. Altagana (Altagana). *fl.* yellow; pedicels solitary. April to July. *l.* with six to eight pairs of glabrous, obovate-roundish, retuse leaflets; petiole unarmed. *h.* 2ft. to 3ft. Dahuria, 1789. Shrub.

C. arborescens (tree-like).* *fl.* pale or bright yellow; pedicels in fascicles. April, May. *l.* with four to six pairs of oval-oblong villous leaflets; petiole unarmed. Stipules spinescent. *h.* 15ft. to 20ft. Siberia, 1752. Tree. (B. M. 1886.)

C. Chamlagu (Chamlagu). *fl.* yellow, at length becoming reddish, large, pendulous; pedicels solitary. May. *l.* with two pairs of distant, oval, or obovate glabrous leaflets; stipules spreading, and, as well as the petioles, spinose. *h.* 2ft. to 4ft. China, 1773. Shrub.

C. frutescens (woody).* *fl.* yellow, resupinate; pedicels solitary. April. *l.* with two pairs of leaflets, approximating the top of the petiole, obovate-cuneated; stipules membranous; petiole furnished with a short spine at the apex. *h.* 2ft. to 3ft. Siberia, 1752. Shrub. (S. B. F. G. 3, 227.) There are one or two varieties of this species.

C. jubata (bearded).* *fl.* white, suffused with red, few; pedicels solitary, very short. April. *l.* with four or five pairs of oblong-lanceolate, lanuginously-ciliated leaflets; stipules setaceous; petioles somewhat spinose. *h.* 1ft. to 2ft. Siberia, 1796. Shrub. SYN. *Robinia jubata.* (L. B. C. 522.)

Caragana—*continued.*

C. pygmæa (pigmy). *fl.* yellow; pedicels solitary. April. *l.* with two pairs linear, glabrous leaflets, approximating at the top of the very short petiole; stipules and petioles spinescent. *h.* 1ft. to 3ft. Siberia, 1751. Shrub. (B. R. 1021.)

C. spinosa (spiny).* *fl.* yellow, solitary, almost sessile. April, May. *l.* with two to four pairs of cuneate-linear, glabrous leaflets; stipules small, spinose; adult petioles permanent, strong, and spinose. *h.* 4ft. to 6ft. Siberia, 1775. An excellent shrub for forming impenetrable hedges, on account of its long branches and strong thorns.

CARAGUATA (its South American name). ORD. *Bromeliaceæ.* Stove epiphytes, allied to *Tillandsia.* For culture, *see* **Billbergia.**

C. lingulata (tongue-shaped-leaved). *fl.* white; flower-stalk erect, with numerous large, broadly-lanceolate, brilliant scarlet bracts. *l.* tufted, broad at the base, linear-lanceolate and recurved. *h.* 1½ft. Columbia, 1880.

C. Van Volxemii (Van Volxem's).* *fl.* yellow, in close spikes, protected by crimson bracts. *l.* tufted. *h.* 2ft. to 3ft. Columbia, 1879. (I. H. 326.)

C. Zahnii (Zahn's).* *fl.* pale yellow, in dense oblong compressed panicles; bracts scarlet. May. *l.* linear-ligulate, 1ft. long, yellow, with crimson stripes, the upper part bright crimson; semi-transparent. *h.* 1ft. Chiriqui, 1870. (B. M. 6059.)

CARAIPI. *See* **Moquilea utilis.**

CARAJURA. A red colouring matter, obtained from **Bignonia Chica.**

CARALLIA (*Karalli* is the name of *C. lucida* in the language of the Telingas). SYN. *Barraldeia.* ORD. *Rhizophoreæ.* Stove evergreen glabrous trees, from Madagascar, Tropical Asia, and Australia. Peduncles axillary, trifid, many-flowered. Leaves opposite, entire or serrated, stiffish, shining on the upper surface. In common with all the *Rhizophoreæ*, this genus is very difficult to grow.

C. lanceæfolia (lance-leaved). *fl.*, petals yellow, rather undulated. *l.* oval or oblong, regularly serrated. *h.* 20ft. India, 1820.

CARALLUMA (*C. adscendens* is called *Car-allum* by the Telingas). ORD. *Asclepiadaceæ.* Stove evergreen shrubs, with almost the habit of *Stapelia.* Peduncles solitary, one-flowered, rising from the axils of the teeth. Stems tetragonal, toothed along the angles. For culture, *see* **Stapelia.**

C. adscendens (ascending). *fl.* variegated with purple and yellow, usually drooping; segments of corolla reflexed at the edges, acuminated, glabrous. Branches slender, ascending, each bearing a solitary flower at top. *h.* 1ft. to 2ft. Coromandel, 1804.

C. fimbriata (fimbriate). *fl.* axillary, solitary, sub-campanulate, drooping; segments of corolla falcate at top, with replicate fringed edges; marked with many transverse purple lines, pale yellow beneath, upper part purple. Branches elongated, attenuated. *h.* 6in. Burma, 1829. (L. B. C. 1863.)

CARAMBOLA-TREE. *See* **Averrhoa Carambola.**

CARANA. The gum resin obtained from a species of *Icica.* It is used in medicine for plasters.

CARAPA (*Carapa* is the name of *C. guianensis* in Guiana). ORD. *Meliaceæ.* A small genus of stove trees, natives of the West Indies, Tropical America, and Guinea. Calyx usually of four distinct sepals; corolla of four or five oblong, egg-shaped, spreading petals. Fruit large, and containing numerous seeds. These trees are of economical utility, and probably the only one in cultivation is *C. guianensis.* They succeed well in a mixture of loam and sand. Ripe cuttings will root in sand, under a hand glass, in a moist heat.

C. guianensis (Guiana). November. *fr.* the size of an apple. *l.*, leaflets eight or ten pairs, alternate or opposite, elliptical, oblong, acuminated, coriaceous, shining. *h.* 60ft. Guiana, 1824. (A. G. 387.)

The other species quoted as having been introduced to this country are: *C. guineensis* and *C. moluccensis.*

CARAWAY. *See* **Carum Carvi.**

CARDAMINE (from *Kardamine*, a diminutive of *Kardamon*, Cress, used by Dioscorides). Lady's Smock. Including *Pteroneurum.* ORD. *Cruciferæ.* A genus of hardy, usually smooth herbs. Racemes terminal, bractless. Leaves stalked, entire, lobed, or pinnately cut, usually very different in the same plant. Only the perennial species are worth growing, and these mostly thrive in a damp, shady situation, in any kind of soil. They are easily propagated by divisions, after flowering.

Cardamine—*continued.*

C. asarifolia (Asarum-leaved).* *fl.* white, in close racemes. May, June. *l.* smooth, stalked, cordate-orbicular, somewhat sinuately-toothed. *h.* 1ft. to 1½ft. Mountains of Southern France and Northern Italy, 1710. (B. M. 1735.)

C. bellidifolia (Daisy-leaved). *fl.* white. April. *l.* smooth, thickish; radical ones stalked, ovate, entire; cauline ones few, entire, or somewhat three-lobed, not eared at the base. *h.* 4in. Northern hemisphere. (F. D. 1, 20.)

C. chelidonia (Celandine-like). *fl.*, petals purple, oval. March. *l.* pinnate, rather smooth; segments stalked, ovate, toothed; lower segments pinnate into three or four small segments. *h.* 1ft. South and East Europe, 1739.

C. glauca (glaucous). *fl.* white, in dense racemes. May. *l.* stalked, smooth, glaucous, rather fleshy, pinnate; segments five or nine, oblong, terminal one three-lobed. Stem diffuse, much branched. *h.* 6in. Southern and Eastern Europe, 1824.

C. latifolia (broad-leaved). *fl.* purplish, a little larger than those of *C. pratensis.* June. *l.* large, pinnate, smooth; segments three or seven, rather orbicular, angularly-toothed. *h.* 1ft. to 2ft. Pyrenees, 1710.

C. macrophylla (large-leaved). *fl.* purple, about the size of those of *C. pratensis.* June. *l.* pinnate, somewhat pubescent; segments five, oval-lanceolate, pointed, unequally serrated. Branches of root creeping. *h.* 1ft. to 1½ft. Siberia, 1824.

FIG. 365. CARDAMINE PRATENSIS.

C. pratensis (meadow).* Cuckoo Flower. *fl.* usually pale purple, but sometimes white. Early spring. *l.* pinnate; segments of the radical ones roundish, of the stem ones linear or lanceolate, entire. *h.* 1ft. to 1½ft. Northern Hemisphere (Britain). See Fig. 365. There are numerous varieties of this species, including a very desirable double-flowered one, frequently met with in a wild state.

C. rhomboidea (rhomboid).* *fl.* white, large. Spring. *l.*, root ones round and rather heart-shaped; lower stem-leaves ovate or rhomboid-oblong, somewhat petioled, the upper almost lanceolate, all somewhat angled or sparingly toothed. Stems upright, from a tuberiferous base, simple. United States of America.

C. r. purpurea (purple).* A very pretty variety, with rounder leaves, and the rose-purple flowers appearing earlier than those of the type.

C. rotundifolia (round-leaved). *fl.* white, rather small. Spring. *l.* nearly uniform, roundish, somewhat angled, often cordate at

Cardamine—*continued.*

the base, petioled, the lowest frequently three-lobed, or of three-leaflets. Stems branching, weak or decumbent. Pennsylvania.

C. trifolia (three-leaved).* *fl.*, petals white, with a broad cuneated claw, and a broad, spreading, obovate limb; scape naked. March to May. *l.* smoothish, ternate; segments sessile, rhomboidal-roundish, toothed. Lower branches root-like, creeping. *h.* 6in. Southern Europe, 1629. (B. M. 452.)

CARDIANDRA (from *kardia*, a heart, and *aner, andros*, a man, anther). ORD. *Saxifrageæ*. A half-hardy evergreen shrub. Flowers corymbose; those at the margin of the corymb barren and radiant. For cultivation, *see* **Hydrangea.**

C. alternifolia (alternate-leaved). *fl.* white, lilac. July. *l.* alternate, stalked, oblong-acute, serrated, and without stipules. *h.* 3ft Japan, 1865. (S. Z. F. J. 65, 66.)

CARDINAL FLOWER. *See* **Lobelia cardinalis.**

CARDOON (*Cynara Cardunculus*). This vegetable, is much esteemed on the Continent, but is not cultivated to any large extent in English gardens. A few are, however, generally grown, being especially in demand where French cooks are employed. The ribs or stalks of the leaves, if well blanched and properly cooked, form an excellent dish in winter.

Cultivation. The preparation of the trenches and ground is somewhat similar to that adopted for celery;

FIG. 366. CARDOON.

but the plants grow much larger (see Fig. 366), and require a space of about 2ft. between them, and 6ft. between the rows. Some growers sow a few seeds in the rows at this distance apart, thinning them out to one plant when established. A much better plan is to sow the required number, in small pots, at the end of April, and place them in a cold frame, where the seed will soon germinate. Mice are very fond of the seed, consequently

Cardoon—*continued.*

the frame must be kept close enough to prevent their entry, or the whole will be destroyed. Select the strongest plant in each pot, as they grow, and destroy the others. Plant out before they become pot-bound, in previously prepared trenches that have been well manured, and water plentifully when necessary. Occasional forking or hoeing between the plants, to encourage growth and destroy weeds, will be all that is required, besides watering, until September or October, when the plants will be ready for earthing up. Before any soil is applied, the stalks must be arranged upright, and closely bound up with haybands to within a foot of the tops. The soil must then be earthed up nearly as high as the haybands reach, and be beaten hard with the spade. It is very important that this operation should be performed on a dry day, when the hearts are free from water, or they will probably decay. The plants will be fit for use in about a month, and may be taken up as required. Should Cardoons be in great demand, an earlier or little later sowing may be made for successional crops. If the plants have to be kept for any length of time during winter, rain and frost must be excluded by means of a covering of litter or other protecting material; or they may be dug up and stored away in a cool, dry place, the haybands being allowed to remain on.

Sorts. The Spanish Cardoon with large solid ribs and spineless leaves, is the one most cultivated; it is liable to run to seed, but not as much as the common sort. The Tours Cardoon is much cultivated in France; but great care is necessary in working amongst them, as the leaves have very long sharp spines. There are one or two other varieties, but the Spanish is most preferable, and is generally grown.

CARDUNCELLUS (the diminutive of *Cardunculus*, the Cardoon, and that from *carduus*). ORD. *Compositæ*. Pretty hardy herbaceous perennials, related to *Carthamus*. Flowers all tubular; pappus setaceous; involucral bracts many-seriate, imbricate; receptacle flat, densely setose or paleaceous. They succeed well in ordinary garden soil, and are readily increased by divisions of the roots. Carduncellus is rarely grown outside botanic collections.

C. mitissimus (least-spiny). *fl.-heads* blue. May, June. *l.*, cauline ones linear, pinnatifid, as long as the plant. *h.* 9in. France and Spain, 1734.

C. monspeliensium (Montpelier). *fl.-heads* blue. June, July. *l.* unarmed; radical ones toothed; cauline ones pinnate. *h.* 9in. South-west Europe, 1776.

CARDUUS (the Latin name used by Virgil, &c.). Thistle. ORD. *Compositæ*. Hardy annuals, biennials, or perennials. Receptacle bristly; involucre tumid, imbricated with spinous bracts; pappus hairs rough, in many series, united by a ring at the base, and deciduous; corollas all tubular, and generally spreading, so as to form a hemispherical head. They are of easy culture in any common soil. None, however, are worth growing in ordinary gardens; but for massing in woods, or in the wild garden, some may be desirable. Hence, we mention the names of a few of the more conspicuous species: *acicularis, Candollei, chrysacanthus, nutans, pycnocephalus* (Blessed Thistle), &c. Two Compositæ frequently met with in gardens, viz., *Silybum Marianum* and *Cnicus benedictus*, are often mentioned in books and catalogues under the generic name of Carduus.

CAREX (from *keiro*, to cut; the leaves of many species have their margins minutely serrated, which cause them to cut the hand if drawn rapidly along them). Sedge. ORD. *Cyperaceæ*. A very large genus of perennial grass-like herbaceous plants, of which upwards of sixty are natives of this country. Inflorescence paniculate, irregularly clustered, spicate or racemose. Stems usually leafy. They are of the easiest possible culture in ordinary garden soil. Propagated by seeds, or by divisions. By far the greater number of this genus possess no horticultural beauty whatever, and are only suitable for naturalising

Carex—*continued.*

near lakes, &c. Some are grown in pots for table decoration, and make beautiful plants for that purpose.

FIG. 367. CAREX BACCANS.

C. baccans (berried). Inflorescence paniculate. Ripe perigynia varying from coral red to lustrous purple. *h.* 2ft. to 4ft. A noble species, from Tropical and Sub-tropical Himalaya. See Fig. 367.

C. Grayi (Gray's). *fl.*, fertile spikes two, or rarely one, consisting of fifteen to thirty flowers, forming globose heads, the ripe perigynia projecting in all directions. July. *h.* 3ft. North America, 1879.

C. intumescens (swollen). *fl.*, spikes usually five to eight-flowered; ripe perigynia projecting outwards and upwards. June. *h.* 1½ft. North America.

C. paludosa (marsh). *fl.*, fertile spikes cylindrical, obtuse. May. *l.* very broad, keeled, rough; bracts very long, foliaceous. *h.* 2ft. Britain. (Sy. En. B. 1668.)

C. pendula (pendulous). *fl.*, fertile spikes very long, pendulous, cylindrical. May. *l.* broad; sheaths elongated, nearly equal to the flower-stalks. *h.* 3ft. to 5ft. Britain. (Sy. En. B. 1660.)

C. pseudo-cyperus (Cyperus-like). *fl.*, spikes on long footstalks, cylindrical, pendulous. June. *l.* ¼in. broad; bracts very leafy. Stems 2ft. to 3ft. high, acutely triangular. Britain. One of the best marked and most beautiful of the genus. (Sy. En. B. 1685.)

C. riparia (river-bank). *fl.*, fertile spikes scarcely pedunculated, broadly cylindrical, acute; scales of the sterile spikes acuminated. May. *l.* broad; bracts very long, foliaceous. Britain. The variegated form of this is well worth growing in borders or among Ferns. (Sy. En. B. 1679.)

Carex—*continued.*

C. sylvatica (wood). *fl.*, fertile spikes filiform, rather slender, slightly drooping; sheaths half as long as the flower-stalks. May and June. *l.* narrow. *h.* 1ft. to 2ft. Britain. (Sy. En. B. 1665.)

CAREYA (named after the Rev. William Carey, of Serampore, a distinguished botanist and linguist). ORD. *Myrtaceæ*. Very handsome stove trees, or small shrubs. Flowers large, with white petals and red or yellow stamens. Leaves alternate, feather-nerved, dotless, glabrous. A mixture of one part sandy loam and two parts fibry peat suits them best. Ripened cuttings root freely, if planted in sand, with a hand glass over them, and placed in a moist bottom heat. Careyas may also be propagated by dividing the roots.

C. arborea (tree-like).* Slow-match Tree. *fl.* sessile; petals white; stamens reddish; spikes terminal, few-flowered. *l.* on short petioles, obovate or oblong, crenate-denticulate, about 1ft. long. *h.* 30ft. to 60ft. India, 1823. Tree. (B. F. S. 205.)

C. herbacea (herbaceous). *fl.* pedunculate; petals greenish-purple; stamens red; racemes short. July. *l.* on short petioles, cuneate-obovate or obovate, serrulate, 4in. to 8in. long. *h.* 6in. to 1ft. Bengal, 1808. Perennial herb, with a woody rootstock.

CARICA (erroneously supposed to be a native of Caria). Papaw-tree. Including *Papaya*. TRIBE *Papayaceæ*. ORD. *Passifloreæ*. A genus of stove evergreen fruit-trees, without branches, yielding an acrid milky juice. Leaves alternate, palmately lobed, standing on long terete petioles. They grow well in a rich, loamy soil. Cuttings of ripe shoots, if not deprived of their leaves, will root readily in a sandy soil, under a bell glass, and in a gentle bottom heat. They are grown in this country more as curiosities than for either ornament or utility.

C. candamarcensis (Candamarcan). Synonymous with *C. cundinamarcensis*.

C. caulifiora (stem-flowering). *fl.* yellowish; male peduncles usually five-flowered, rising from tubercles on the trunk. *l.* palmately five-lobed; intermediate lobes sinuated; segments lanceolate, acuminated. *h.* 10ft. to 20ft. South America, 1806.

C. cundinamarcensis (Cundinamarcan). *fl.* green. *fr.* yellow, edible. *h.* 6ft. Ecuador, 1874. SYN. *C. candamarcensis*. (B. M. 6198.)

C. Papaya.* Common Papaw. *fl.* greenish; male ones corymbose. July. *l.* palmately seven-lobed; segments deeply lobed, oblong, acute. *h.* 10ft. to 20ft. South America, 1690. (B. M. 2898.)

CARICATURE PLANT. *See* **Graptophyllum hortense.**

CARINA. A keel, like that of a boat; also applied to the lower petals of a pea-flower.

CARINATE. Keel-shaped.

CARINATELY-CONCAVE. Hollowed in such a manner as to resemble a keel externally.

CARINATELY-WINGED. Having a wing resembling a keel.

CARIOPSIS. A one-celled one-seeded superior fruit, whose pericarp is membranous and united to the seed, as in wheat, maize, and other kinds of corn.

CARISSA (probably a native Indian name, in Mahratta, *Korinda*). ORD. *Apocynaceæ*. A genus of stove shrubs and trees. Flowers white; peduncles axillary and terminal, many-flowered, everywhere becoming sterile and spinescent. Leaves opposite, furnished with intrapetiolar bristles. They are best grown in a compost of peat and loam. Cuttings of ripe wood will strike if placed in sand, under a glass, in bottom heat. They are of economical value in their native countries.

C. Carandas (Carandas). *fl.* milky-white, Jasmine-like; corymbs terminal and axillary, few-flowered. July. *l.* ovate, mucronate, or elliptic, obtuse, glabrous; spines often two-forked. Sub-arboreous. *h.* 15ft. to 20ft. India, 1790. (L. B. C. 663.)

C. grandiflora (large-flowered).* *fl.* white, fragrant, salver-shaped, 2in. across. May. *l.* deep green; spines axillary, forked. Natal, 1862. (B. M. 6307.)

C. spinarum (spiny). *fl.* white; petals lanceolate; peduncles terminal, four to five-flowered. August to December. *l.* small, ovate, acute, veiny, shining. Branches dichotomous; spines, two at each ramification opposite, the one above the branch and the other below it, red at top, and shining. *h.* 20ft. India, 1809. (L. B. C. 162.)

Carissa—*continued.*

C. Xylopicron (bitter-wooded). *fl.* white; petals acute; peduncles lateral, spiny, one to two-flowered. July. *l.* ovate, acuminated, glabrous, three to five-nerved. Branches forming a pyramidal cyme. *h.* 20ft. Bourbon, 1820.

CARLINA (from *Carolinus*, pertaining to Charles, commemorative of the famous Charlemagne, whose army was said to have been cured of the plague by it). ORD. *Compositæ*. Hardy or half-hardy annuals, biennials, or perennials. Pappus feathery; receptacle chaffy; involucre imbricated, tumid, the outer scales with numerous spines, the inner coloured, spreading, resembling a ray. They are of very easy culture in ordinary garden soil. A few only are worth growing, and are readily increased by seed, sown in spring.

FIG. 368. CARLINA ACAULIS.

C. acanthifolia (Acanthus-leaved).* *fl.-heads* white. June. *l.* pinnatifid, downy beneath; segments toothed, angular, spiny. Plant stemless. *h.* 2ft. Southern Europe, 1818. Hardy perennial. (A. F. P. iii., 51.)

C. acaulis (stemless). *fl.-heads* white. June. *l.* pinnatifid, naked; segments cut-toothed, spiny. Stem simple, one-flowered. *h.* 9in. Europe, 1640. Hardy perennial. SYN. *C. subacaulis*. See Fig. 368. (G. C. 1880, xiii., 1720.)

C. Biebersteiniana (Bieberstein's). *fl.-heads* purple. August. *h.* 2ft. Caucasus, 1816. Hardy perennial.

C. subacaulis. A synonym of *C. acaulis*.

CARLUDOVICA (named after Charles IV. of Spain, and Louisa, his queen). SYNS. *Ludovia, Salmia* (of Willdenow). ORD. *Cyclanthaceæ*. A genus of low-growing, palm-like, stove plants. Flowers of separate sexes, in squares arranged very close together in a spiral manner, and forming cylindrical spikes. Leaves stiff, plaited, deeply cut into from two to five divisions. Plants unarmed. The species are very ornamental, and several are eminently adapted for sub-tropical gardening, for which purpose they are largely employed in Parisian gardens. They are easily grown with the usual routine of stove management, thriving in a compost of two parts peat and one of sandy loam; a liberal supply of water is needed.

C. atrovirens (dark-green).* *l.* and petioles very deep green, smooth, deeply bilobed. A very fine ornamental-leaved plant.

C. Drudei (Drude's).* *fl.* ivory white, borne on an erect-stalked, terete spadix, of cylindrical form. *l.* rich deep green, 17in. long, and about 33in. in transverse diameter, tufted, transversely oblong in outline, palmately three-lobed, the lobes plicated, and deeply and regularly incised at the margin. *h.* 4ft. Columbia, 1878. (G. C. n. s. 8, 715.)

C. ensiformis (ensiform). *fl.* white, in close spikes. *l.* bipartite, ensiform. *h.* 2ft. Costa Rica, 1875. (B. M. 6418.)

C. humilis (dwarf).* *l.* rich deep green; 12in. to 18in. long, 9in. to 12in. broad at the widest part, rhomboid, deeply bifid at the apex. New Grenada. A very handsome but rare species. (R. H. 1869, 71.)

C. palmata (palmate).* *l.* rich dark green, 2ft. to 3ft. across, bifid at apex, and divided quite down to the point of attachment into four lobes, each of which is divided into narrow segments; petioles 4ft. to 6ft. in height, round, smooth. Peru, 1818. See Fig. 369. (R. H. 1861, 10.)

C. purpurata (purplish). *l.* deep green, 2ft., or more, long, and 12in. to 18in. broad, bifid at the apex, tapering towards the base; petioles 2ft. to 4ft. high, smooth, reddish-purple. Tropical America.

Carludovica—*continued.*

C. rotundifolia (round-leaved).* *l.* flabelliform, divided in two places quite down to the point of attachment, thus presenting a trilobed appearance; lobes divided into segments, which are very gracefully pendent. Costa Rica.

C. Wallisii (Wallis's).* *fl.* white, very sweetly scented, disposed in roundish oblong heads. *l.* ovate, two-lobed, and plicate; each division is about 1ft. long, and 6in. or 8in. broad; petioles erect, semi-terete. Columbia, 1879. (R. G. 992.)

CARMICHÆLIA (named after Captain Dugald Carmichael, F.L.S., an acute Scotch botanist, author of the "Flora of the Island of Tristan da Acunha," inserted in the twelfth volume of the Linnæan Society's Transactions). ORD. *Leguminosæ*. Very ornamental greenhouse evergreen shrubs, flowering for a considerable length of time. They thrive in a compost of sandy peat, to which may be added a very little fibry loam and leaf soil. Cuttings of half-ripened side shoots root in sand, under a glass, in a cool house, in April or May.

FIG. 369. CARLUDOVICA PALMATA.

Carmichælia—*continued.*

C. australis (southern).* *fl.* lilac; racemes simple, rising from the denticulations of the branches. May, September. *l.* with three to seven obcordate leaflets. Branches compressed. *h.* 2ft. to 4ft. New Zealand, 1823. (B. R. 912.)

CARNATION (*Dianthus Caryophyllus*). These charming flowers were, at one time, universal favourites, and the varieties were far more numerous than now. In the early days of gardening, they were often called Gilliflowers as well as Carnations. For some unaccountable reason, after 1850, they were seriously neglected, and many of the old varieties were entirely lost to cultivation; they are now, however, regaining popular favour, and are not only cultivated by specialists, but scarcely any garden can afford to be without some. There are no hardy flowers more deserving general cultivation than Carnations, as they present charming diversity and brilliancy of colouring, with a delicious perfume. Their stateliness of growth, and value in a cut state, are also characteristics greatly in their favour.

PROPAGATION may be effected by layers, pipings, or by seed.

Layers. This method is far more generally adopted than any other, whether the plants are grown in pots, borders, or beds. The end of July, or the beginning of August, is the best time for layering. Before commencing, a compost of leaf soil, loam, and sharp sand, in nearly equal proportions, should be prepared. Some pegs can be made of bracken stems, or other material of a like nature, which will decay in the soil. A layer of the compost, about 2in. in thickness, should be placed around each plant, as in this the young plants will root. The shoots selected should be denuded of a few of their leaves at the base of the young wood, and a slit must be made from this point upwards, extending through a joint of the bare stem, so that a tongue is formed. The layers should next be carefully pegged down in their place, keeping the incision open. About 1in. of soil must then be placed over the layered part to a little beyond the peg, and the whole well watered. If dry weather ensue, it will be necessary to give occasional waterings; but care must be taken that the shoots are not denuded of soil. Plants layered in pots should be placed in the open till they are rooted, which usually takes a month or five weeks. *See also* **Layering.**

Pipings. Where shoots are too short or too numerous for layering, or where they become broken by accident, it is desirable to propagate by pipings; such shoots may be removed before the time for layering. For this mode of propagation, it is necessary to have a slight hotbed, and on it to put 4in. or 5in. of fine light soil, covered with silver sand. The pipings must be long enough to have a tolerably firm base, and they must either be taken with a heel, or cut off at a joint, and firmly inserted in the soil. After a good watering, the light should be placed upon the frame, and the pipings must be kept close, and shaded. The soil must be maintained moderately moist till the roots are formed, but damp must be guarded against.

Seed. Propagation of Carnations by seed is a very interesting operation. By this means, new and excellent varieties are raised. Both single and double-flowered plants are produced from a packet of seed; the latter can be selected, and the best perpetuated by layering. The principal nurserymen supply seed of good quality, or anyone with a good strain may save his own. Hybridising may be effected with the best flowers in each class, so as to secure seed which will probably produce new kinds. The most suitable time for sowing is in April or May, and the best place a slight hotbed, or in a greenhouse. The pans should be properly drained, then filled with fresh sandy loam and leaf soil to within an inch or so of the top, making it tolerably firm, and the surface afterwards levelled, before sowing the seed. This should be scattered evenly over the soil, and then slightly covered with a little of the potting mixture, finely sifted. To keep the whole uniformly moist,

Carnation—*continued.*

a piece of glass should be laid on the top of the pan, till the seeds germinate; after which, the covering should be removed, and the pans placed in an airy position near the glass. As soon as the seedlings can be handled, they should be pricked out in beds, previously prepared by mixing in some fresh loam and rotten manure with the ordinary soil, and watered when necessary, to assist them in their growth. By the end of September, the plants will be sufficiently large to transfer to their permanent position in beds or borders, where they will bloom the following season.

GENERAL CULTIVATION. *Winter Treatment.* In favoured positions, many kinds will withstand the winter, especially if the soil is light and well drained. Generally, however, it is necessary to provide accommodation, for a portion of the stock at least, in cold frames; and when a choice collection is grown, it would be useless to attempt to keep it intact without winter protection. About September, when the layers or pipings are well rooted, they should be potted singly or in pairs, the former in 3in., and the latter in 4in. pots, according to the size of the plants. The potting compost should consist of loam two parts, leaf soil one part, and sand one part, with a fair amount of drainage. After potting, a good watering should be given, and the frame kept close for a week or two, until root-action is resumed, when air may be freely admitted. All through the winter, full advantage should be taken of fine weather to give all the air possible, by tilting, or entirely removing, the lights. If bleak winds prevail, it will be best to tilt the lights in an opposite direction to the wind. Until the beginning of February, when, as a rule, the plants begin to grow, great attention must be paid to watering. They must be kept somewhat dry rather than excessively wet, as the greatest enemy in winter is damp. If kept too wet, a disease known as "Spot" is likely to appear in the foliage, which may prove very prejudicial. Watering those that are dry, with a small-spouted can, so as to avoid unduly wetting the foliage, is preferable to using a rose. After February, they may have more water; in fact, it will then be very unwise to allow them to get at all dry.

Cultivation in Pots. The end of February, or the beginning of March, is, as a rule, the best time for potting; but, to some extent, this must be regulated by the season and condition of the plants. Pots 10in. in diameter are large enough to accommodate a pair of good strong plants, while weaker growing ones may be placed in 9in., or even 8in. pots. These should be well drained, and a layer of leaf soil or rotten manure placed over the crocks. The following is an excellent potting compost: Two parts good fibrous sandy loam, not broken too finely, one part leaf mould, and one part good rotten old hotbed manure, to which may be added a good sprinkling of coarse, gritty sand, from a river if it can be procured; well mix the whole together, but do not pass through a riddle. Pot the plants moderately firm, and sufficiently deep to allow of the layers being got to the surface without fear of breaking off. After potting, place back in the frame again, and keep well ventilated, until the plants show signs of fresh growth, when they may be stood outside in an airy position. Watering must be very carefully performed for some time after potting, and staking the leading growths must not be delayed, or they will be broken with the wind. If large flowers are required, the buds should be thinned in their early stages, and means taken to prevent the splitting of the calyx. Should there be signs of this, make two or three incisions in the opposite side, and fasten a piece of matting round it, which will materially assist to keep the petals together. In order to produce fine blooms for exhibition or other purposes, it will be necessary to thin the buds severely, leaving only the primary or finest ones to develop. For flowering, the plants are best removed to a cool greenhouse, where an abundance of air can be afforded; this protection will greatly lengthen the period of blooming, and materially assist to bring out the quality of the flowers. Where this

Carnation—*continued.*

is not practicable, a few lights, or some tiffany, should be temporarily arranged over them, when the same end will be gained; and after the plants are layered, the covering can be removed.

Cultivation in Beds or Borders. With the choicer varieties grown in pots, a magnificent collection may be cultivated in specially prepared beds or positions in an ordinary border. There are a large number of beautiful Selfs, and fancy border varieties, as a rule richly scented, which are far better treated in the open ground; and, presuming a special bed is allotted them, which is a much preferable method, even if duplicates are planted in the mixed border, it is necessary to ridge up the bed in the autumn for exposure to the sweetening effects of wintry weather, and the extermination of insects. At the same time, a dressing of soot and lime, mixed, may, with advantage, be well incorporated with the soil, for the destruction of these pests, especially the wireworm, which is a very troublesome insect in Carnation culture. An addition of leaf soil and sharp sand should also be made if the soil is stiff or clayey. The plants should be put out in March, about 1ft. apart each way; more space between the lines may be allowed if desired, according to the size or shape of the bed. Keep the beds clean, and, when dry, thoroughly watered. As the buds expand, occasional doses of liquid manure will be found beneficial. It will also be necessary to thin the buds if large blooms are required, as recommended for those grown in pots. When grown in odd spaces in the border, equally as much attention is needed as when grown in beds. The blossom-stalks require staking in order to display the flowers, and to keep them from being soiled. Very neat stakes should be used, and they should be neither longer nor shorter than really

FIG. 370. METHOD OF STAKING CARNATIONS.

required. A very good form of wire stake is shown in Fig. 370, with which tying is unnecessary.

Insects. Green fly is the most troublesome. As a rule, unless in very dry seasons, they do not attack those planted out; but, when grown in pots, and while the young plants are in the frames, they are very likely to cause great injury. The best means of eradicating them is by tobacco fumigation; and it is better to give a thorough fumigation before the young growth is developed. If they are troublesome after, it will again be necessary to fumigate, but rather repeat than overdose the plants. Wireworms are very destructive at the roots. The soil should be carefully looked over before being used for potting, as any wireworms left in it would eat the roots as fast as they are formed, eventually killing the plant. Should established plants be attacked, some carrots placed in the soil will form a good trap, as the wireworms eat into them, and may easily be removed and destroyed.

PROPERTIES. The characteristics of a good Carnation are as follows: The pod (*i.e.*, calyx) should be long, as then

Carnation—*continued.*

the flower is not liable to burst it, as is the case when it is short. The flower should be quite circular, and rising up gradually towards the centre, so as to form half a ball. The outer, or guard petals, should be large, and few in number, rising slightly above the calyx, then spreading horizontally; and the other petals should be regularly disposed on them, nearly flat, and diminish in size towards the centre. The texture of the petals should be thick and wax-like, and the markings distinct and clear; the ground a pure white, any flushing or running of the colour being a decided disqualification.

FIG. 371. FLOWERS OF BIZARRE CARNATION.

CLASSES. There are three distinct classes, viz.: Bizarres, (see Fig. 371), Flakes, and Selfs. The Bizarres have a clear ground, variously marked and flaked with two or three colours; of these there are Crimson, Scarlet, and Pink and Purple varieties, each characterised by the distinguishing colours predominating. Flakes have a pure ground, flaked with one colour, of which there are Scarlet, Purple, and Rose varieties. Selfs should be one-coloured, in any shade, but the more defined, the more effective they are. The following is a selection of the best varieties in each class, at present grown, to which additions are constantly being made:

Crimson Bizarres. A. D. SOUTHGATE (Dodwell), BLACK DIAMOND (Haines), ECCENTRIC JACK (Fletcher), E. S. DODWELL (Hewitt), ISAAC WILKINSON (Turner), J. D. HEXTALL (Simonite), JENNY LIND (Puxley), JOHN SIMONITE (Simonite), LORD MILTON (Ely), MARGUERITE (Dodwell), MILLIE (Dodwell), QUEEN VICTORIA (Fletcher), RIFLEMAN (Wood), SATURN (Gorton), SIR GARNET WOLSELEY (Fletcher), THOS. MOORE (Dodwell).

Pink and Purple Bizarres. FALCONBRIDGE (May), JAMES TAYLOR (Gibbons), LORD CLIFTON (Puxley), MISS HENDERSON (Dodwell), MRS. BARLOW (Dodwell), OLIVE (Fletcher), PRINCESS BEATRICE (Beardsley), SARAH PAYNE (Ward), TOM FOSTER (Dodwell), T. S. WARE (Dodwell).

Scarlet Bizarres. ADMIRAL CURZON (Easom), ALFRED HUDSON (Dodwell), ARTHUR MEDHURST (Dodwell), BEN SIMONITE (Dodwell), CARACTACUS (Dodwell), CHARLES TURNER (Dodwell), DANDY (Dodwell), DUKE OF GRAFTON (Hooper), EDWARD ADAMS (Dodwell), FANNY GARDINER, FRED (Dodwell), GUARDSMAN (Ward), JIM WHITAKER (Dodwell), JOHN HINES (Dodwell), LORD NAPIER (Taylor), MARS (Hextall), MASTER STANLEY (Dodwell), MR. FAWCETT (Fletcher), RAYNER JOHNSON (Dodwell), SIR JOSEPH PAXTON (Ely), TOM BROWN (Dodwell), TOM POWER (Dodwell), WILFRID SYMES (Dodwell), WM. SPOOR (Adams).

Purple Flakes. ATTRACTION (Fletcher), BEAUTY OF WOODHOUSE (Mansley), DR. FOSTER (Foster), DR. WHITRON (Fletcher), EARL STAMFORD (Elliott), G. F. WILSON (Dodwell), JAMES DOUGLAS (Simonite), LADY PEEL (Haslam), MAYOR OF NOTTINGHAM (Taylor), MAYOR OF OXFORD (Dodwell), SQUIRE TROW (Jackson).

Rose Flakes. JAMES MERRYWEATHER (Wood), JESSICA (Turner), LADY GARDENER (Ely), MADGE WILDFIRE (Dodwell), MARY ANN

Carnation—*continued.*

(Fletcher), MR. BUCKLEY (Fletcher), MRS. BARRETT (Fletcher), MRS. MATTHEWS (Dodwell), RACHAEL (Fletcher), ROB ROY (Gorton), ROSE OF STAPLEFORD (Holmes).

Scarlet Flakes. ANNIHILATOR (Jackson), CLIPPER (Fletcher), DAN GODFREY (Holmes), FRIAR TUCK (Dodwell), HENRY MATTHEWS (Dodwell), ILLUMINATOR (Puxley), JAMES CHEETHAM (Chadwick), JOHN BALL (Dodwell), RICHARD GORTON (Dodwell), RISING SUN (Kirtland), SCARLET KEET (Dodwell), SPORTSMAN (Fletcher), WILLIAM LANG (Dodwell), WILLIAM MELLOR (Dodwell).

Selfs. ALBERT (Turner), purple; ARETHUSA (Dodwell), magenta; AUCTIONEER (Ware), deep magenta, very fine; BRIDE (Overs), pure white, very fine; CONSTANCE (Dodwell), rich rose; CORONER (Ware), bright scarlet; CRIMSON, old double Clove; CYNTHIA (Dodwell), bright rose, very pretty; GERTRUDE TEIGNER (Ware), rich pink, very fine; GLOIRE DE NANCY (Lemoine), pure white, very vigorous and free; GOG (Dodwell), carmine-purple; KING OF THE YELLOWS (Abercrombie), rich sulphur-yellow; LADY ROSEBERY (Turner), the best yellow Self; MARY MORRIS (Smythe), rich salmon-rose, immense; MRS. MATTHEWS (Matthews), pure white, freely fringed; SPARKLER (Ware), crimson-scarlet; VIVID (Dodwell), very brilliant scarlet; W. P. MILNER (Fisher), pure white, of grand substance, one of the best.

TREE OR PERPETUAL. These are, without doubt, some of the most useful plants grown for cut bloom, and their culture is of the easiest. Some growers strike the cuttings from July till the end of August, in gentle heat, or layer the old plants in a frame, in August, and, when well rooted, pot them off into 3in. pots, or the stronger ones into 4in. pots, in which the plants are wintered the first season, in an airy position near the glass. The second season, the plants are grown on, and not allowed to bloom through the summer, about two shifts being given until they are in 10in. pots. Meanwhile, the shoots are trained as required, and the general shape of the plant arranged. When the pots are filled with roots, liquid manure should be supplied, and, about the middle of September, they may be taken indoors, giving plenty of air for some days. By maintaining a temperature of from 45deg. to 50deg., and applying liquid manure, plenty of bloom may be obtained through the winter and early spring months. For potting soil, use good fibrous yellow sandy loam three parts, and one part rotten manure, with enough sand to keep the whole sufficiently porous to admit of the free passage of water. Another excellent method of cultivation is to put the cuttings in, selecting the small side shoots, about the middle of January, in bottom heat, of about 70deg. to 75deg., with an atmospheric temperature of 60deg. to 65deg.; or they may be struck in a half-spent hotbed, when it will not be advisable to put them in till February. As soon as rooted, they should be potted off, and gradually hardened, so that they will bear removal to the greenhouse, where they should remain till April. They may then be shifted on, and grown liberally in pots, or be planted out. In June, go over the plants, and take off the tops; and, about once a fortnight, remove the tops of any of the side shoots which may appear likely to bloom. About the end of September, the plants should, if placed out, be carefully potted up, and shaded for a week or ten days, keeping them well supplied with moisture; and, after root action is resumed, removed to the greenhouse, and an unlimited supply of air given until frost sets in. Only sufficient fire heat should be applied in winter to maintain a temperature of 50deg. to 55deg., and a free circulation of air should be admitted on all favourable occasions during the day.

Fumigate if fly should put in an appearance; and for mildew, flowers of sulphur should be thoroughly dusted over the plants, washing it off after three days, taking care to remove all dirt from the plants.

Varieties. These are numerous, and their number constantly being added to. The following are among the best:

A. ALEGATIERE, bright scarlet; AMAZON, buff, edged scarlet; BELLE ROSE, rose; BOULE DE FEU, scarlet; BRIDE, pure white; COVENT GARDEN, scarlet; DRAGON, scarlet; FIREFLY, bright scarlet; FLORENCE, clear buff-yellow; GARIBALDI, rosy-scarlet; GOURDAULT, scarlet, crimson-flaked; HENSHAW'S, scarlet; JEAN BART, bright scarlet; JEAN SISLEY, yellow, red-edged; LA BELLE, pure white, very fine; LEE'S, scarlet; MADAME ALEGATIERE, carmine-rose; MAIDEN'S BLUSH, blush-white; MISS JOLLIFFE,

Carnation—*continued.*

blush-pink; MRS. G. HAWTRY, bright yellow; OSCAR, yellow; PRINCE OF ORANGE, yellow, edged with crimson; PURITY, white; REMBRANDT, large crimson; SOUVENIR DE MALMAISON, blush-white; VALIANT, rosy-scarlet; VAN DYCK, white, striped rose VULCAN, mottled-red.

CARNAUBA PALM. *See* **Copernicia cerifera.**

CARNOSE. Fleshy; of thick substance.

CAROB-TREE. *See* **Ceratonia Siliqua.**

CAROLINA ALLSPICE. *See* **Calycanthus floridus.**

CAROLINEA. *See* **Pachira.**

CARPEL. A division of the ovary; one of the modified leaves forming the pistil.

CARPENTERIA (named after the late Professor Carpenter, of Louisiana). ORD. *Saxifrageæ.* An ornamental tall-growing shrub, which will thrive in any good loamy soil, and will probably prove hardy in this country. It is too recent an introduction for us to be able to speak more definitely respecting it.

C. californica (Californian).* *fl.* white. *l.* broadly lanceolate, entire, 2in. to 3in. long, pinnately-veined, whitened beneath with a minute and close pubescence. Sierra Nevada, California, 1880.

CARPINUS (Latin name used by Pliny). Hornbeam. ORD. *Cupuliferæ.* Hardy deciduous trees, mostly medium-sized. Male flowers, catkins later, sessile, cylindrical; bracts imbricate. Female flowers in lax terminal

FIG. 372. FLOWERING BRANCH OF CARPINUS BETULUS.

catkins; outer bracts entire; inner bracts in pairs, three-lobed. Leaves simple, alternate, exstipulate, deciduous. *C. Betulus* is the one most generally grown. It forms a good hedge plant, and bears pruning well, while the leaves remain on after they are dead, thus affording good shelter. It is not much grown in this country, but its timber is valuable; it is also very useful as an agricultural tree, to shelter exposed fields, as it endures rough and windy situations, and thrives well in common soil. The seeds, which are formed in a small nut, are ripe at the end of autumn, but they vegetate irregularly, some coming the

Carpinus—*continued.*

first year, some the second. If they grow thickly, they should be transplanted when a year old, but if thinly, they may be allowed to stand for two years, and then transplanted, cutting off the extremities of the roots. After two years in nursery lines, they are fit for hedges. If not then removed, and a greater space allowed them to grow in, they will run up tall, and be unfit for hedge plants.

C. americana (American).* *l.* ovate-oblong, pointed, sharply doubly serrate, soon nearly smooth; bractlets three-lobed, halbert-shaped, sparingly cut-toothed on one side. *h.* 10ft. to 50ft. North America, 1812.

C. Betulus (Birch-like).* Common Hornbeam. *fl.* yellowish. May. *fr.*, bracts flat, oblong, serrated, with two lateral lobes; nuts brown, ripe in October or November. *h.* 50ft. to 70ft. Britain. See Fig. 372. There are several varieties, including *aurea-variegata* (golden-variegated-leaved), *incisa* (cut-leaved), *quercifolia* (Oak-leaved), and *variegata* (variegated).

CARPOCAPSA POMONANA. *See* **Apple** or **Codlin Grub.**

CARPODINUS (from *karpos*, a fruit, and *dineo*, to turn round; application disputed). ORD. *Apocynaceæ.* Stove evergreen climbing shrubs, thriving in a mixture of open loam and sandy peat. Easily propagated from cuttings of half-ripened shoots. The best known species is:

C. dulcis (sweet). *fl.* green, almost sessile, twin, axillary. June. *l.* ovate-lanceolate, glabrous. *h.* 8ft. Sierra Leone, 1822. A fruiting shrub.

CARPODONTOS. *See* **Eucryphia.**

CARPOLYSA (from *karpos*, a fruit, and *lyssa*, rage; in reference to the peculiar method of opening). ORD. *Amaryllideæ.* A very pretty little bulb, from the Cape of Good Hope. For culture, *see* **Ixia.**

C. spiralis (spiral).* *fl.* white, reddish outside; scapes filiform, 4in. to 6in. high, spirally twisted from the base to the middle, thence straight; perianth tube short, widening upwards; umbels two to four-flowered; spathe two-leaved April and May. *l.* spiral, filiform. 1791. SYN. *Strumaria spiralis.* (B. M. 1383.)

FIG. 373. SHORT CARROT.

CARROT (*Daucus Carota*). Hardy biennial. The wild Carrot is a native of Britain. This is generally a

Carrot—*continued.*

very important crop, or rather series of crops, as, in order to keep up a good supply fit for table, it is necessary to sow often, so as to have a succession of young tender roots, free from the hard core which is invariably present in many of the large varieties.

Soil. Carrots require soil that is of a good depth and, if possible, rather light. It should not be specially manured for them, or they will produce forked roots, instead of growing straight down. Ground that has been manured for a previous crop will suit better. It should also be free from wireworms, or other injurious grubs. Many gardens do not contain soil suitable for good Carrot culture; in such cases, it would be advisable to grow the short varieties (see Fig. 373), and prepare a sufficient depth of soil for them.

Cultivation. Having selected the site, deeply dig the ground for the Short varieties, or trench to a depth of

FIG. 374. LONG CARROT.

from 18in. to 2ft. for the Long kinds (see Fig. 374). This should be done as early in autumn as possible, and the ground left in ridges for the winter, forking it over in spring. Before sowing, rake the ground level, and draw shallow drills, from 8in. to 12in. apart, according to the sort grown. In these drills thinly sow the seeds; and here a little discretion and care are required. The seeds being very liable to stick together, it is advisable that they should be mixed with sharp sand, and well rubbed between the hands, to separate them, otherwise the plants will come up in thick clusters or bunches. After sowing, lightly cover the seeds with fine soil, and again rake over the whole of the ground, to remove stones and make the soil fine. As soon as the rows can be seen, flat hoe the beds, to destroy weeds, or they will grow much faster than the Carrots, and make it a difficult matter to clear them. When the plants are large enough, thin them out to about 4in. apart, again removing some when large enough to

Carrot—*continued.*

cook. The main crops will be ripe and ready to lift during October, or early in November, according to the season. Carefully lift in dry weather, cutting off the leaves close to the crowns, and store the roots in moist sand or soil, in a cool place. For table use, the Horn varieties are, perhaps, the best. To secure a succession, sow small quantities on a warm border, under a wall, in February, in March, and again in April. The main crop should be sown about the end of March, and additional sowings made each month until August. The smaller kinds will only require a space of about 8in. between, and 6in. in the rows; on this account, they are most useful for small gardens.

Forcing. Early Carrots are generally in great demand, and to obtain them it is necessary to sow on a hotbed in early spring. A great heat is not necessary, but it should be constant. Stable litter, with plenty of leaves well mixed with it, should be prepared and put into a frame with a depth of 3ft. or 4ft. Tread it firmly and evenly, and allow it to remain for a few days before sowing. About 6in. of light soil will be sufficient, and the seeds may be sown thinly, either broadcast or in shallow drills, afterwards watering in. The first sowing should be made early in February, and succession beds kept up until the end of April, according to the quantity required. Give air on every favourable opportunity so soon as the plants are up, or they will quickly get drawn. They should only be moderately thinned at first, allowing them to grow large enough for use, and then removing the largest each time for this purpose. Early French Forcing is one of the best varieties for forcing purposes.

FIG. 375. UMBEL OF CARROT.

An umbel of Carrot, intact, is shown at Fig. 375. It is necessary to thoroughly separate the seeds before sowing.

FIG. 376. CARROT, JAMES'S INTERMEDIATE.

Sorts. There are many varieties of Carrots in cultivation, but some are not fit for table use, on account of their

Carrot—*continued.*

pale colour or the hardness of the core. The following may be relied on as some of the best for any purpose. Forcing and early crops: Common Early Horn, Early French Forcing, Early Nantes, and Early Short Horn (see Fig. 373). Main crops: Altrincham, James's Intermediate (see Fig. 376), Long Horn (see Fig. 374), and Long Red Surrey.

CARROT BLOSSOM MOTH (*Depressaria daucella*). The caterpillars of this moth inflict considerable damage on the Carrot seed-crop, in summer, by eating away the flower-heads, which they envelop with their webs. According to Miss Ormerod, the caterpillar is of a greenish-grey or yellowish colour, with black, hairy warts, and some faint streaks along the back; and the head, as well as the upper side of the first segment behind it, is brown or black. It is only about ½in. long when full grown. Sometimes the caterpillar changes to the chrysalis in the flower-head; sometimes it bores for this purpose into the stem. The moth is little more than ¾in. in the spread of the upper wings; the head and body between the wings are reddish-brown, freckled with black. The upper wings are of the same colour, freckled with white, and having black streaks, and the under sides dark; the hind wings are light grey.

The only effectual way of destroying this pest is to shake the infested plants, when the caterpillars will descend by means of a thread, and may be killed by burning or otherwise. A dusting of powdered Hellebore would probably be of some service; but, being a deadly poison, it should be used with great caution.

CARROT FLY. *See* **Carrot Grubs.**

CARROT GRUBS (*Psila rosæ*). The grub of the Carrot Fly, which plays such havoc among Carrots, is cylindrical, and of a pale yellow colour; the body tapers slightly towards the mouth, while the other end is rounded; its skin is smooth and shining; the tail has two little black tubercles. When the larva is full grown, it quits the Carrot, and, burrowing into the earth, becomes a pupa, light brown in colour, and oval. The perfect fly is shining black, slightly tinged with a greenish lustre. It has yellowish legs, white "balancers," and hyaline transparent wings; the head is reddish-yellow, and the antennæ and palpi tipped with black.

These grubs are probably the most destructive insects that attack Carrots. They bore into the roots, causing the tops to turn brown and eventually to die. The crop is almost entirely lost in some gardens in consequence. As soon as any plants are observed to be sickly, they should be pulled up, and either burned or destroyed by some other means. Dressing the ground with lime the previous autumn, or the drills with lime and soot when sowing, is sometimes a good preventative. It is also important not to use the same ground for Carrots two successive years, especially if these insects or any wireworms are present in the soil.

CARTHAMUS (from the Arabic *qurtom*, to paint; Hebrew *garthami*; referring to the flowers yielding a fine colour). Safflower. ORD. *Compositæ*. Pretty hardy annuals. Pappus paleaceous, hairy, or none; receptacle paleaceous, setose; involucre ovate, imbricated; scales ovate, leafy at end. They thrive in any ordinary soil. Seeds should be sown in a gentle hotbed, in spring; and, when the seedlings are large enough to handle, they should be transplanted to a situation where they are intended to flower. These plants should only be grown in large gardens.

C. lanatus (woolly). *fl.-heads* yellow. South Europe, 1596. Hardy annual. (B. M. 2142.)

C. oxyacantha (sharp-spined). *fl.-heads* yellow. July. *h.* 2ft Caucasus, 1818.

C. tinctorius (dyers'). Saffron Thistle. *fl.-heads* orange. June. *l.* ovate, entire, spiny-toothed. Stem quite smooth. *h.* 3ft. Egypt, 1551. (B. R. 170.)

CARTILAGINOUS. Gristly, tough, or leathery.

CARUM (from *Karos*, the Greek name used by Dioscorides). Caraway (originally found at Caria, in Asia Minor). Including *Ptychotis*. ORD. *Umbelliferæ*. Glabrous herbs. Flowers white. Leaves pinnate; segments or leaflets multifid. Roots tuberous. Caraway is a naturalised biennial, and will do well in most garden soils if tolerably dry in winter. The seeds are best sown in autumn, or in March, in drills 1ft. apart, and the plants, when strong enough, thinned out to about 8in. in the rows. The ground will require an occasional hoeing. Seeds will be produced in the following summer, ripening about August. These are much used, after being dried, in confectionery, and sometimes for flavouring and perfumery. For culture of *C. Petroselinum*, *see* **Parsley.**

C. Carvi (Caraway). *fl.* white; involucre and involucels wanting. May. *l.* bipinnate; leaflets decussate, multifid. Stems furrowed. *h.* 1½ft. Europe. (Sy. En. B. 582.)

C. Petroselinum (Petroselinum). Parsley. *fl.*, involucre of few, partial one of many, leaflets. June and July. *l.* decompound, shining; lower leaflets ovate-cuneate, trifid, toothed; upper ones lanceolate, nearly entire. Europe (naturalised in Britain). SYN. *Petroselinum sativum*.

CARUMBIUM. A synonym of **Sapium.**

CARYA (from *karya*, a Walnut-tree, from *karyon*, a nut). Hickory. SYN. *Scorias*. ORD. *Juglandaceæ*. Very handsome hardy deciduous trees, far too rarely seen in this country. This genus differs from *Juglans* in having the male catkins clustered, with from three to ten stamens in each flower, and the firm (at length) dry exocarp splitting into four regular valves, and falling away from the smooth, bony endocarp or shell. Leaves alternate, exstipulate, of five to fifteen leaflets, serrate; the lateral ones in opposite, or nearly opposite, pairs, and all spreading in one plane. Propagation is effected by nuts, planted where the trees are intended to remain, as most of the species have very long tap roots, which, with the exception of *C. amara*, are nearly destitute of fibres. The species here described are all North American.

C. alba (white).* Shell-bark Hickory. *fl.*, catkins glabrous. May. *fr.* globular or depressed; nut white, compressed, barely mucronate, the shell thinnish. *l.*, leaflets five, finely serrate, when young minutely downy beneath; the lower pair oblong-lanceolate, the three upper obovate-lanceolate. *h.* 50ft. to 70ft. (W. D. B. 148.)

C. amara (bitter).* Bitter Nut, or Swamp Hickory. *fl.*, sets of catkins in pairs. April. *fr.* globular, narrowly six-ridged; nut globular, short-pointed. *l.*, leaflets seven to eleven, lanceolate or oblong-lanceolate, pubescent when young, afterwards almost glabrous. *h.* 50ft. to 60ft. 1800. (T. S. M. 226.)

C. olivæformis (Olive-formed). Pecan Nut. *fr.*, nut olive-shaped. *l.*, leaflets thirteen to fifteen, oblong-lanceolate, tapering gradually to a slender point, falcate, serrate. *h.* 30ft. 1766.

C. porcina (pig). Pig Nut, or Broom Hickory. *fr.*, nut oblong or oval, with a thick bony shell. *l.*, leaflets five to seven, oblong or obovate-lanceolate, and taper-pointed, serrate, glabrous or nearly so. *h.* 70ft. to 80ft. (T. S. M. 224.)

C. tomentosa (tomentose).* Mocker Nut; White-heart Hickory. *fl.*, catkins short, and lower surface of leaves tomentose when young, resinous-scented. May. *fr.* on some trees globular or ovoid, with a thick and hard husk; nut globular, not compressed, four-ridged towards the slightly pointed summit, brownish, very thick shelled. *l.*, leaflets seven to nine, obovate-lanceolate, or lower oblong-lanceolate, pointed. *h.* 60ft. to 70ft. 1766. (T. S. M. 222.)

C. t. maxima (largest). *fr.* globose, nearly twice the size of that of the type; "as large as an apple;" husk exceedingly thick.

CARYOCAR (from *karyon*, a nut; the large fruits contain edible nuts). Butter Nut. SYN. *Rhizobolus*. ORD. *Ternstrœmiaceæ*. Large stove trees, of easy cultivation in loamy soil. Ripened cuttings will root in sand, under a hand glass, in heat. There are about eight species, all tropical American; the only one calling for mention here is *C. nuciferum*.

C. nuciferum (nut-bearing). Souari or Butter Nut. *fl.* racemose; calyx and corolla purple; stamens white, numerous; anthers yellow. Drupe 5in. to 6in. in diameter, four-celled, each cell containing one nut, embedded in white pulp; shell very hard, tubercled; kernel or seed edible, covered by a red-brown membrane, internally pure white, soft, fleshy, and rather oily, of a very agreeable flavour. *l.* trifoliolate; leaflets elliptical-lanceolate, obscurely serrated, smooth. *h.* 100ft. 1823. (B. M. 2727.)

CARYOPHYLLEÆ. An extensive order of herbs, with stems swollen at the joints. Flowers terminal, solitary, or disposed in racemes, panicles, or corymbs. Leaves entire, opposite. Well-known genera are: *Arenaria*, *Cerastium*, *Dianthus*, *Lychnis*, *Saponaria*, and *Silene*.

CARYOPHYLLUS (from *karuophyllon*, Clove-tree; literally nut leaf, from *karuon*, a nut, and *phyllon*, a leaf). Clove-tree. The Arabs, who have been acquainted from all antiquity with the Clove, called it Qarumfel, which the Greeks altered to Caryophyllon. ORD. *Myrtaceæ*. A stove evergreen tree, now generally referred to genus *Eugenia*. Cymes terminal, or sub-corymbose, in the forks of the branches. Leaves opposite, coriaceous, dotted. It grows best in a mixture of loam and peat. Cuttings of firm shoots, with the leaves left on, will root if planted in a pot of sand, with a hand glass over them, and placed in a moist heat. It is difficult to preserve this tree through the winter.

C. aromaticus (fragrant).* *fl.*, petals pale purple; calyx dark purple; cymes many-flowered. *l.* ovate-oblong, acuminated at both ends. *h.* 20ft. to 40ft. Moluccas, 1796. The flowers of this tree are the cloves of commerce.

CARYOPTERIS (from *karuon*, a nut, and *pteron*, a wing; fruit winged). ORD. *Verbenaceæ*. Ornamental, hardy, herbaceous or sub-shrubby perennials, with a bushy habit. They thrive in ordinary garden soil. Propagated by seeds, by divisions, or by cuttings.

C. Mastacanthus (moustache).* *fl.* rich violet; peduncles axillary, fastigiate. Autumn. *l.* ovate-oblong, petiolate, obtuse, coarsely serrated, downy. *h.* 2ft. China, 1844. A handsome greenhouse or half-hardy herbaceous plant, growing freely in any garden soil. It requires plenty of water during the summer months. SYN. *Mastacanthus sinensis*. (B. R. 1846, 2.)

C. mongolica (Mongolian). *fl.* violet-blue, numerous, in small long-stalked axillary corymbs, forming loose spikes nearly 2ft. long. *l.* opposite, lanceolate-elliptic, greyish-green, hoary beneath. *h.* 3ft. Chinese Mongolia, 1869. (R. H. 1872, 451.)

CARYOTA (old Greek name *karuotis*, used by Dioscorides; the Greeks first applied this name to their cultivated Date). ORD. *Palmeæ*. A genus of about a dozen species of very noble stove palms, with bipinnate leaves, the ultimate divisions of which have the shape of the fins and tail of a fish—features which distinguish the present from all other genera of the order. They attain their full size before commencing to flower; the spadices, which are developed first at the top, and last at the very foot of the trunk, are large, and their spikes hang down in bundles. When the flowers have been produced from the trunk, nearly at ground level, the plant dies, unless it has previously developed suckers. Two species, *sobolifera* and *urens*, are frequently employed in sub-tropical gardening, from June till September, and their unique appearance renders them well suited for the purpose. When in a young stage, Caryotas form excellent ornaments for dinner tables, &c. They require a compost of loam and vegetable mould in equal parts, with the addition of a little sand; thorough drainage, and a liberal supply of water during the growing season, are essentials to success. Propagated easily by seeds, or by suckers; the first named are frequently produced in this country.

C. Cumingii (Cuming's).* *l.* large, dark green, spreading, bipinnate, 4ft. to 6ft. in length, and 3ft. in width; pinnules 8in. to 10in. long, sub-falcate, obliquely wedge-shaped below, and erosely toothed upwards. The spadices hang in drooping tassel-like tufts from the axils of the leaves, and the flowers are succeeded by bright red berries, which lend an additional charm to this beautiful stove plant. Trunk or stem slender, about 10ft. high. Philippine Islands, 1841. (B. M. 5762.)

C. maxima (largest). *l.* bipinnate; pinnæ coriaceous, rigid, elongated, dimidio-lanceolate, acuminate. Stem tall. Java, 1849.

C. mitis (mild). *l.* reclining; pinnæ cuneiform, oblique, præmorse. *h.* 20ft. China, 1820.

C. propinqua (neighbouring). *l.* bipinnate; pinnæ coriaceous, sessile, dimidiato-rhomboid, obtuse or acuminate, præmorse. Stem tall. Java, 1850.

C. purpuracea (purple). *l.* bipinnate; pinnæ unequal, both in size and shape; petioles clothed with rusty tomentum. *h.* 30ft. Java, 1848. This species resembles *C. urens*, but is

Caryota—*continued.*

more compact, the petioles are not so long, and the leaves more numerous.

C. Rumphiana (Rumph's).* *l.* bipinnate, spreading, 3ft. to 8ft. long; pinnules sessile, coriaceous, obliquely cuneate and præmorse, 4in. to 6in. in length, and the same in breadth at the widest part, lying very flat and even, and deep green in colour. Indian Archipelago. Very handsome and distinct.

C. sobolifera (sucker-bearing).* *l.* bipinnate; pinnæ bright light green; petioles, when young, clothed with a short black scaly tomentum. Malacca, 1843. An elegant, slender-stemmed, somewhat dwarf species, not very unlike *C. urens* in the form of the leaves. Suckers are more freely produced by this species than by any other. See Fig. 377.

FIG. 377. CARYOTA SOBOLIFERA.

C. urens (stinging). *l.* bipinnate, spreading, 3ft. to 12ft., or even more, in length; pinnules obliquely cuneate, sub-coriaceous, erose, caudate, 6in. to 9in. in length, and 4in. in breadth, dark green. Stem stout. *h.* 50ft. India, 1788. Probably the largest-growing species.

CASCADE, or **WATERFALL.** This, says Loudon, is an obvious improvement where a running stream passes through a demesne, and is to be formed by first constructing a bank of masonry, presenting an inclined plane to the current, and rendering it impervious to water by the use of cement; and next by varying the ridge of the bank, and the bed of the river below it, with fragments of rock, so chosen and placed as not to present a character foreign to what Nature may be supposed to have produced there. The adjoining ground frequently requires to be raised at such scenes, but may be harmonised by plantations. Where

Cascade, or **Waterfall**—*continued.*

running water is conducted in the forms belonging to the geometric style of gardening, Cascades are constructed in the form of crescents, flights of steps, or wavy slopes, all of which produce excellent effects when appropriately introduced.

CASCARILLA BARK. *See* **Croton Eluteria.**

CASEARIA (named after J. Casearius, who assisted Rheede in the "Hortus Malabaricus"). ORD. *Samydaceæ.* A genus of stove evergreen trees, with astringent and medicinal properties, but of no ornamental value. There are numerous species.

CASHEW NUT. *See* **Anacardium occidentale.**

CASIMIROA (named after Cardinal Casimiro Gomez). ORD. *Rutaceæ.* A genus, allied to *Skimmia,* containing a couple of species, the one hitherto introduced being an evergreen greenhouse tree, succeeding well in rich friable loam with perfect drainage. It is very likely that this fine fruiting tree will be extensively grown when better known, as it would probably succeed in the open air in the Channel Islands, in the south and south-west of England, and in Ireland. We have hitherto failed in striking cuttings, as also in finding a stock on which it will graft. It may, however, be readily raised from seeds.

C. edulis (edible).* White Sapota. *fl.* green, small. *fr.* about the size of a St. Michael orange, borne on the two-year-old wood, of a greenish-yellow colour when ripe, and having a delicious melting flavour, like that of a peach. *l.* digitate. Mexico, 1866. (G. C. n. s., viii. 465.)

CASPARIA SPECIOSA. *See* **Bauhinia petiolata.**

CASSANDRA (name of mythological origin). ORD. *Ericaceæ.* A small genus of hardy shrubs, sometimes included under *Andromeda. C. calyculata,* distributed throughout the Northern Hemisphere, is the only species known, *C. angustifolia* being merely a form of it. They thrive best in peat or sandy loam. Propagated by layers or by seeds, which latter, being very small, require to be covered lightly with earth.

C. angustifolia (narrow-leaved).* *fl.* snow-white; corolla oblong ovate, with a contracted mouth, on short pedicels, axillary, disposed in the manner of recurved racemes at the tops of the branches. April. *l.* linear-lanceolate, acute, with sub-undulated edges, rusty beneath. *h.* 1ft. to 2ft. Carolina, 1748. SYN. *C. crispa.*

C. calyculata (small-calyxed).* *fl.* snow-white; corolla oblong-cylindrical, on short pedicels; racemes terminal, recurved, leafy. April. *l.* elliptic-oblong, bluntish, obsoletely serrulated, rusty beneath. *h.* 1ft. to 3ft. North America, 1748. There are several unimportant varieties of this species. (B. M. 1286.)

C. crispa (curled). Synonymous with *C. angustifolia.*

CASSAREEP. The concentrated juice of Manihot roots, rendered harmless by boiling.

CASSEBEERA (derivation obscure). ORD. *Filices.* Stove ferns, from Brazil. Sori terminal on the veins, subglobose or oblong, not reaching beyond the branches of a single vein. Involucre inserted distinctly within the margin, and separate from it, of the same shape as the sorus, and pressed down upon it. For culture, &c., *see* **Ferns.**

C. pinnata (pinnate).* *sti.* 6in. to 12in. long, stout, erect. *fronds* about 6in. each way, pinnate; pinnæ crenate, linear-oblong; margins of the segments much incurved in the mature plant. *sori* in close rows along the margins.

C. triphylla (three-leaved). *sti.* 2in. to 3in. long, slender, wiry. *fronds* digitate, ¾in. each way; segments three to five, nearly equal, linear oblong. *sori* in close rows along the margins of the segments. 1824.

CASSIA (the Greek *kasia* of Dioscorides, from Hebrew *quetsi'oth*). ORD. *Leguminosæ.* A very large genus of shrubs or herbs, containing over two hundred species, few of which are seen in English gardens. Flowers yellow. Leaves abruptly pinnate; leaflets opposite; petioles usually glandular. *C. corymbosa* is about the only species grown, and even this is not frequently met with. They are

Cassia—*continued.*

all of very easy culture and propagation. The stove and greenhouse species thrive well in a compost of maiden loam, sand, and a little peat. *C. corymbosa* may be placed out of doors, in a sheltered warm spot in June; but, so soon as the frost touches the foliage, the plant should be potted up, and, after cutting it back nearly to the old wood, wintered in a cool, frost-proof greenhouse or vinery. The annuals and biennials are increased by seeds, which must be sown in March or April, in a gentle heat; and the shrubby species, by cuttings of half-ripened shoots, which will root in heat, at about the same time of the year. Stove evergreen shrubs, except where otherwise specified.

C. alata (winged-leaved).* *fl.* yellow, large, bracteolate. *l.* with eight to twelve pairs of obovate-oblong glabrous leaflets, outer ones the largest, lower ones approximating to the axils. *h.* 6ft. West Indies, 1731. Shrub.

C. auriculata (small-eared). *fl.* yellow; bracts oval-oblong; racemes axillary. June, July. *l.* with eight to twelve pairs of oval, obtuse, rather mucronate leaflets, which are puberulous when young; petioles glandular. *h.* 4ft. to 6ft. India, 1777. Shrub.

C. bacillaris (rod). *fl.* yellow; racemes axillary, pedunculate. June, July. *l.* with two pairs of ovate, obtuse, oblique leaflets, with a gland on the petiole between the lower pair. *h.* 12ft. to 14ft. South America, West Indies, &c., 1782. Tree.

C. Barclayana (Barclay's). A synonym of *C. Sophora.*

C. biflora (two-flowered). *fl.* yellow; peduncles two to four-flowered, much shorter than the leaves. April, December. *l.* with six to eight pairs of oval-oblong or obovate, rather glabrous leaflets, with a subulate gland on the petiole between the lower pair. *h.* 4ft. to 6ft. South America, 1766. Greenhouse. (B. M. 810.)

C. corymbosa (corymbose).* *fl.* yellow, disposed in numerous corymbs. Summer. *l.* with three pairs of oblong-lanceolate, rather falcate leaflets, which are glabrous as well as the branches, with an oblong gland on the petiole between the lower pair. *h.* 6ft. to 10ft. Buenos Ayres, 1796. Half-hardy.

FIG. 378. FLOWERING BRANCH OF CASSIA MARYLANDICA.

C. emarginata (notched-leaved). *fl.* yellow; racemes axillary, crowded. May, June. *l.* with four pairs of ovate, obtuse, or rather emarginate leaflets, clothed with hairy pubescence beneath, as well as the branches, and glandless petioles. *h.* 15ft. West Indies, &c., 1759. Tree.

C. floribunda (many-flowered). *fl.* yellow; peduncles many-flowered. June, July. *l.* with three to five pairs of oblong-lanceolate, glabrous leaflets, with an oblong gland on the petiole between the lower pair. *h.* 4ft. New Spain, 1818. Stove annual.

Cassia—*continued.*

C. glauca (milky-green). *fl.* sulphur-coloured; racemes axillary, erect, shorter than the leaves. June. *l.* with five to six pairs of oval-oblong leaflets, which are glaucous beneath, puberulous when young; petioles glandular, one gland between each of the three or four lower pairs of leaflets. India, 1800. A tall tree.

C. Herbertiana (Herbert's). Synonymous with *C. lævigata.*

C. humilis (dwarf). A synonym of *C. Tora.*

C. lævigata (smooth). *fl.* yellow. July. *l.* with three to five pairs of ovate-lanceolate, acuminated, glabrous leaflets, with an oblong acutish gland between each of the pairs on the petiole. *h.* 3ft. New Spain. SYN. *C. Herbertiana.* (B. R. 1422.)

C. marylandica (Maryland).* *fl.* yellow; racemes axillary, many-flowered, shorter than the leaves. August, October. *l.* with eight to nine pairs of ovate-oblong, equal, mucronate leaflets, with an ovate gland at the base of the petiole. *h.* 2ft. to 3ft. North America, 1723. This is the only hardy perennial species, and should be grown in a sheltered situation. It thrives in any common garden soil; and may be increased by seeds, or by dividing at the root, in spring. See Fig. 378.

C. nictitans (twinkling). *fl.* yellow; pedicels supra-axillary, very short. July. *l.* with eight to twelve pairs of oblong-linear, obtuse, mucronate leaflets; petioles villous, bearing a somewhat pedicellate gland beneath the lower pair of leaflets. *h.* 1ft. Tropical and sub-tropical America, 1800. Greenhouse annual.

C. occidentalis (western). *fl.* yellow; peduncles short, two to four-flowered, lower ones axillary, the rest disposed in a terminal raceme. May, August. *l.* with four to six pairs of ovate-lanceolate leaflets, with pubescent margins, and with a thick gland at the base of the petiole. *h.* 1ft. to 2ft. South America, 1759. (B. R. 83.)

C. Sophora (Sophora). *fl.*, peduncles axillary and terminal, shorter than the leaves, many-flowered. June. *l.* with six to eight pairs of linear-lanceolate, acute, glabrous leaflets, with a fascicle of glands between each of the pairs of pinnæ, and a large depressed one at the base of the petiole. *h.* 8ft. to 10ft. Australia, &c., 1824. Greenhouse. SYN. *C. Barclayana.* (S. F. A. 32.)

C. tomentosa (tomentose).* *fl.* yellow. July, September. *l.* with six to eight pairs of oval-oblong, obtuse leaflets, which are nearly glabrous above, but clothed with hoary tomentum beneath; petiole furnished with glands, usually with one between each pair of leaflets. *h.* 5ft. to 7ft. Tropical Asia, &c., 1822.

C. Tora (Tora). *fl.* yellow. August. *l.* with three pairs of obovate, obtuse leaflets, with an oblong gland between each of the two lower pairs on the petiole, which ends in a bristle. *h.* 2ft. to 5ft. Tropics, 1693. Stove annual. SYN. *C. humilis.*

CASSIDA. A synonym of **Scutellaria** (which *see*).

CASSINE (the native name given by the American Indians of Florida). ORD. *Celastrineæ.* This genus as now understood is restricted to the species mentioned below. A greenhouse evergreen shrub, with opposite, smooth, coriaceous leaves, and axillary peduncles, bearing small flowers. It grows freely in a mixture of loam and peat; and ripened cuttings will readily strike root, if planted in a pot of sand, with a hand glass placed over them.

C. concava (concave). Synonymous with *Celastrus lucidus.*

C. Maurocenia (the old generic name, after Mauroceni, a Venetian senator and patron of botany). Hottentot Cherry. *fl.* at first greenish-yellow, but changing at length to white; pedicels many, very short. July and August. *l.* sessile, obovate, quite entire, convex. *h.* 6ft. South Africa, 1690.

CASSINIA (named after M. Henri Cassini, an eminent French botanist). ORD. *Compositæ.* A handsome genus of, for the most part, greenhouse shrubs or herbaceous perennials. Flower-heads very numerous, small, disposed in terminal corymbs or panicles; florets tubular; receptacle furnished with linear scales. Leaves alternate, entire, revolute. The species are of easy culture in a loam and peat compost. The annual is increased by seeds only, which must be sown on a warm border during April. The herbaceous and shrubby kinds are propagated in April by dividing at the roots, or by cuttings of half-ripened shoots, placed in sand.

C. aurea (golden). *fl.-heads* yellow. July. *h.* 1ft. New South Wales, 1803. Greenhouse shrub. (B. R. 764.)

C. denticulata (small-toothed).* *fl.-heads* yellow. Summer. *h.* 6ft. to 8ft. New South Wales, 1826. Greenhouse evergreen shrub.

C. spectabilis (showy). *fl.-heads* very pale yellow. July. *l.* lower ones oblong, shortly acuminate, stem-clasping, 4in. to 6in. long, woolly. *h.* 6ft. Australia, 1818. Hardy annual. (B. R. 678.)

CASSIOPE (of classical derivation). ORD. *Ericaceæ.* A genus of small, hardy, Heath-like shrubs, sometimes, but erroneously, included under *Andromeda.* Flowers solitary,

Cassiope—*continued.*

pedunculate, lateral or terminal. Leaves small, imbricated. All the species are delicate little plants, and require great care in their culture. They are best planted in sandy peat, and partially shaded. Propagated by layers.

C. fastigiata (pyramidal). *fl.* white or pale red; corolla campanulate, solitary, pedunculate, produced at the top of the little branchlets. May. *l.* imbricated in four rows, with revolute membranous margins, elongated at top; peduncles woolly. Himalayas. An elegant little shrub, thriving when planted on rockwork in deep, moist, but well drained soil, where it will be carefully guarded from drought, which is fatal to it. (B. M. 4796.)

C. hypnoides (moss-like).* *fl.* small, with a red calyx and white campanulate corolla, solitary, drooping, lateral, on somewhat long pedicels. June. *l.* imbricated, loose, needle-shaped. Lapland and North America, 1798. A small moss-like creeping shrub, forming one of the best and most interesting of alpine plants, and of rather difficult culture. It delights in gritty, moist, but well-drained peat, with full exposure to sun and air. To establish it perfectly, it should be pegged down when first planting; it is also advisable to place a few stones around the neck of the plant on the surface of the soil. Drought is also fatal to its successful cultivation. SYN. *Andromeda hypnoides.* (B. M 2936.)

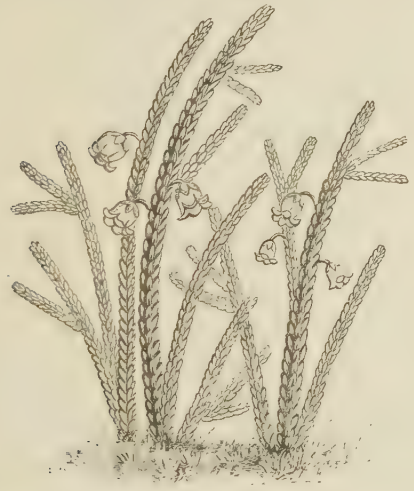


FIG. 379. CASSIOPE TETRAGONA.

C. tetragona (four-angled).* *fl.* white; corolla campanulate, somewhat contracted near the mouth, solitary, and rather freely produced. March. *l.* imbricated in four rows, obtuse, pointless, minutely ciliated; margins revolute. *h.* 6in. to 8in. Lapland, 1810. An elegant little evergreen, requiring partial shade, sandy peat or leaf soil, and a moist or semi-bog situation. It has recently been proved to thrive well in a rich yellow loam. See Fig. 379. (B. M. 3181.) In gardens, this is usually called *Andromeda tetragona.*

CASTANEA (from Castanea, a town in Thessaly, or from another town of the same name in Pontus). Chestnut. ORD. *Corylaceæ.* Large, spreading, deciduous trees. Male flowers clustered on long naked cylindrical catkins, with a five to six partite perianth. Female flowers, two or three together in a prickly four-lobed involucre, which eventually completely encloses the glossy brown fruits or nuts. Leaves simple, alternate, stipulate, deciduous, serrated. The nuts are eaten as gathered, or baked and flavoured with salt. In some parts of France, where corn is scarce, Chestnuts are ground up as a substitute for flour. It is, however, very hard when baked. A sandy loam suits the Sweet or Spanish Chestnut best. A warm, rather sheltered site is an important point when the ripening of the fruits is a consideration; but the trees will grow freely, and form good specimens, in almost any position. The young trees must have all side shoots removed, until they form stems of sufficient height.

PROPAGATION is effected by seed, grafting, or budding, but chiefly by seed.

Seed. The ripest and best-formed may be sown as soon as ripe; or they may be kept till February or March. By

Castanea—*continued.*

adopting the latter course, the risk of destruction by rodents, &c., is greatly lessened. Some stratify the nuts in damp sand, during winter, and plant them out in spring, at the same time removing the points of the radicles or growing roots, with a view to making the trees more dwarf and seoner fertile. The simplest way, however, is to sow either in November or February, in drills, 1ft. apart, and 3in. deep, placing the nuts 3in. or 4in. apart in the rows. If the plants make rapid growth, they can be replanted the following November, in drills 3ft. apart, and the plants 2ft. asunder. On good soil, and with proper attention, they will be fit for finally placing out in from three to four years from the time of sowing.

Grafting is resorted to for increasing any good variety for fruiting. All may be perpetuated in this way; but a few are so distinct that a large percentage of similarly good sorts may be expected from their seeds.

Budding may be performed in July, or any time after the buds are sufficiently plump. Good large fruiting varieties are rather scarce, and anyone contemplating growing these, should make sure of getting the best, either from a first-class English nursery, or from the Continent.

PLANTING. The Chestnut looks well planted singly or in groups. In the latter case, from 20ft. to 30ft. apart will be suitable distances, and from three to fifteen trees in a group will give a noble effect. For coppices or underwood, the trees should be planted about 5ft. apart, the coppice being cut every twelve or fifteen years.

C. pumila (dwarf). *fl.* green, yellow. July. Nut solitary, not flattened. *l.* oblong, acute, serrate with pointed teeth, whitened, downy underneath. *h.* 12ft. North America, 1699.

FIG. 380. CATKIN AND FRUIT OF SPANISH CHESTNUT (CASTANEA SATIVA).

C. sativa (cultivated).* Sweet, or Spanish, Chestnut. *fl.* yellowish. July. *fr.* greenish, enclosing a brown nut, ripe in October. *l.* oblong-lanceolate, acuminate, mucronately serrated, glabrous on each side. *h.* 50ft. to 70ft. Asia Minor. SYN. *C. vesca.* See Figs. 380 and 381. The varieties are numerous; but two only need be mentioned as worth growing, in addition to the type, and these are *C. s. foliis aureo-marginatis*, with golden-edged foliage; and *C. s. heterophylla dissecta*, in which the leaves are divided into thread-like segments.

C. vesca (edible). Synonymous with *C. sativa.*

FIG. 381. FRUITING BRANCH OF SWEET CHESTNUT (CASTANEA SATIVA).

CASTANOSPERMUM (from *kastanon*, a chestnut, and *sperma*, a seed; in reference to the seeds, which taste like chestnuts). Moreton Bay Chestnut. ORD. *Leguminosæ*. This genus is limited to a single species, which is a large greenhouse evergreen tree, endemic in Australia. For culture, *see* **Ceratonia.**

C. australe (southern). *fl.* saffron-coloured; calyx coloured; racemes axillary or lateral, rather loose. *l.* impari-pinnate; leaflets broad, smooth, entire. *h.* 40ft. to 50ft. 1828.

CASTILLEJA (named in honour of D. Castillejo, a botanist of Cadiz). ORD. *Scrophularineæ*. Herbaceous, rarely suffruticose plants. Flowers axillary, solitary or terminal, and spicate; corolla tubular, compressed, bilabiate. Leaves alternate, entire, trifid or multifid; bracts large and coloured. These are very ornamental plants, but, with one or two exceptions, are rarely seen in cultivation. All are probably more or less parasitic in habit, and this accounts for the difficulty generally experienced in preventing the plants from being altogether lost. All succeed in a peat soil, with a little leaf mould and sand, but some do better in good loam. Hardy and half hardy species may be increased by seeds.

C. coccinea (scarlet).* *fl.* yellow; bracts scarlet. July. *l.*, as well as the coloured bracts, divaricately trifid. *h.* 1ft. North America, 1787. Hardy annual. (B. R. 1136.)

C. indivisa (undivided).* *fl.* greenish-yellow; bracts wholly carmine-red. *l.* sessile, ascending, oblong; upper ones margined with red. *h.* 6in. to 12in. Texas, 1878. Hardy in sheltered positions; best raised from seed annually. (B. M. 6376.)

C. lithospermoides (Lithospermum-like). *fl.* scarlet. August. *h.* 1ft. Mexico, 1848. Half-hardy. (F. d. S. 4, 371.)

C. miniata (vermilion).* *fl.* yellow, with vermilion-scarlet bracts. *l.* lanceolate or linear, entire. *h.* 1ft. to 2ft. California, 1874. Hardy annual.

C. pallida (pale) * *fl.*, spike simple, with pale, nearly white or yellowish bracts. June. *l.*, radical ones linear, acuminated, entire; superior ones alternate, ovate-lanceolate, toothed. Plant tomentose. *h.* 6in. to 12in. Siberia and Arctic North-West America. Hardy annual.

CASTILLOA (probably commemorative of Castillejo). A genus (containing two or three species) belonging to

Castilloa—*continued.*

the order *Urticaceæ*, and having male and female flowers, alternating one with the other, on the same branch. *C. elastica* contains a milky juice, yielding Caoutchouc.

CASTOR-OIL PLANT. *See* **Ricinus communis.**

CASUARINA (supposed to be derived from the resemblance of the long, weeping, leafless branches to the drooping feathers of the Cassowary, *Casuarius*, which is a native of the same country as the majority of the *Casuarinas*). Beefwood. ORD. *Casuarineæ*. Very interesting and remarkable greenhouse evergreen trees. Male flowers in cylindrical spikes; perianth of one or two concave or hood-shaped segments. Female flowers in globose or ovoid spikes or cones; perianth none. They thrive well in a compost of loam and peat, with a portion of sand. The stronger growing species do well in loam. Propagated by cuttings, made of half-ripened shoots, in April, and placed in sand, under a bell glass; or by seeds.

C. distyla (two-styled). *fl.* diœcious; scales of cones unarmed, ciliated. Branchlets ovate, round. *h.* 15ft. Australia, 1862. (H. F. T. i., 348.)

C. equisetifolia (Equisetum-leaved). *fl.*, scales of cones unarmed, ciliated. Branchlets flaccid, round. *h.* 15ft. Australia.

C. quadrivalvis (four-valved). Synonymous with *C. stricta*.

C. stricta (upright). *fl.*, scales of cones villous; male sheaths sub-multifid, ciliated. Young branches somewhat flaccid. *h.* 18ft. Australia, 1812. SYN. *C. quadrivalvis*. (H. F. T. i., 347.)

CASUARINEÆ. An order of jointed leafless trees or shrubs, with striated internodes. Flowers unisexual, the males in distinct whorls, forming a cylindrical spike; the females in dense axillary heads, without any perianth. Nuts winged, collected in a cone hidden under the thickened bracts. The only genus is *Casuarina*.

CATALPA (the Indian name of the first species). ORD. *Bignoniaceæ*. Trees with simple leaves, opposite, or disposed three in a whorl. Flowers terminal, panicled; corolla campanulate, with a ventricose tube, and an unequal four-lobed limb. As a single specimen upon the lawn, or occupying the edge or skirting of any moderate-sized, sheltered shrubbery, very few things are superior to a well-grown plant of *C. bignonioides*. It thrives in almost any soil. Propagated by seed sown in spring, by layers, or by cuttings of the ripened shoots, made in autumn. The same cultural remarks are generally applicable to all the species except *longissima* and *microphylla*, which are stove species of easy culture, and are propagated by cuttings made of the ripened shoots, placed in heat, under a glass.

C. bignonioides (Bignonia-like).* *fl.*, corollas white, speckled with purple and yellow; panicles large, branchy, terminal. July. *l.* cordate, flat, three in a whorl, large, deciduous. *h.* 20ft. to 40ft. N. America, 1726. SYN. *C. syringæfolia*. (B. M. 1094). See Fig. 382. The form with bright yellow-tinted leaves is very ornamental.

C. Bungei (Bunge's). *fl.* greenish-yellow, with red spots, large, disposed in simple clusters or racemes. *l.* ovate, acuminate, entire, or lobed, glabrous. *h.* 8ft. to 10ft. North China.

C. Kæmpferi (Kæmpfer's).* *fl.* small, sweet-scented, disposed in branching panicles; corolla clear yellow, spotted with reddish-brown; lobes toothed. July. *l.* ovate, cordate at the base, abruptly sharp-pointed, and often with one or more sharp-pointed lateral lobes. Japan, 1862.

C. longissima (longest).* *fl.*, corolla whitish, undulating, crenated,; upper segment marginate. *l.* oblong, or ovate lanceolate, acuminated, three in a whorl, undulated. *h.* 30ft. to 40ft. West Indies, 1777.

C. microphylla (small-leaved). *fl.* white, large; limb undulated; peduncles terminal, usually three-flowered. *l.* opposite, obovate, obtuse. *h.* 10ft. to 20ft. St. Domingo, 1820.

C. speciosa (beautiful).* *fl.* white, large, disposed in rather large panicles; upper lip of the corolla longer than the lower, which is bilobed. June. United States, 1879. This comes close to

Catalpa—*continued.*

FIG. 382. FLOWERING BRANCH OF CATALPA BIGNONIOIDES.

C. bignonioides, but may be distinguished from that species chiefly by its softly downy, slender, acuminate and inodorous leaves, marked with similar glands in the axils of the principal veins on the under side; by its much less crowded racemes, and by its much larger flower, fruit, and seed.

C. syringæfolia (Syringa-leaved). A synonym of *C. bignonioides*.

CATANANCHE (from *katanangke*, a strong incentive; referring to an ancient custom among the Greek women of using it in love potions). ORD. *Compositæ*. Very pretty and free-growing annuals or perennials. Pappus scaly pointed; involucre scarious; florets all ligulate; heads solitary, on long stalks. They thrive in ordinary border soil. Increased by seeds, which should be sown in March or April, and the young plants, when large enough, potted off or pricked out in the position they are intended to occupy. The flowers are very useful for cutting.

C. cærulea (blue). *fl.-heads* blue, or blue and white. August. *l.* hoary, narrow, lanceolate, with one or two little teeth on each side. *h.* 3ft. South Europe, 1596. Hardy perennial. The form producing blue and white flowers is known in gardens as *C. bicolor*. See Fig. 383. (B. M. 293.)

C. lutea (yellow). *fl.-heads* yellow. June. *h.* 1ft. *l.* similar to those of *C. cærulea*. South Europe, 1640. Hardy annual. (S. F. G. 821.)

CATASETUM (from *kata*, downward, and *seta*, a bristle; referring to the position of the two horns of the column). ORD. *Orchideæ*. A large genus of strong, rapid-growing stove epiphytes, more curious than beautiful. Flowers generally green, in erect or drooping racemes from the base of the stem; sepals and petals of a firm, leathery texture. Leaves plaited, membranous. It is probable that if better known, this genus, as well as its allies, *Cycnoches* and *Mormodes*, would be more generally cultivated, as the singular structure of their flowers always commands a considerable amount of interest; while the manner in which the pollen masses of the Catasetums are ejected, is in itself a great curiosity. Another characteristic of the Catasetums and Cycnoches is the occasional production of two or three kinds of flowers on the same plant, sometimes on the same flower-spike. So dissimilar are these flowers, that, when first observed, they were considered to belong to distinct genera, and named respectively *Catasetum*, *Monachanthus*, and *Myanthus*, the first name

Catasetum—*continued.*

being assigned to the large fleshy flowers furnished with horns or feelers, and which are now generally considered to be the seed-bearing flowers; the second to the hornless, sterile flowers; and the last to those which, together with other structural differences, bear the horns at the base, instead of the apex, of the column. When growing, too much water can scarcely be given them, provided they be well drained; but, when resting, they should be dried as thoroughly as a deciduous Dendrobe; the resting period to continue from the time the new growths are fully completed until they again begin to grow, no matter how long it may be, unless flower-spikes appear, in which case water should be given until the flowers are decayed. Catasetums may be grown with considerable success in pots, but baskets are much more satisfactory.

C. barbatum (bearded). *fl.*, sepals and petals narrow, green, and blotched with purple; lip green and pink, outer edge fringed, delicate fibres of a dull white, like a beard. May. Demerara, 1836. (B. R. 1778.)

C. callosum (hardened).* *fl.* brownish-yellow; petals linear-lanceolate, same form as dorsal sepal; lip ovate-oblong, obtuse, saccate towards the base, crenated and furnished above the sac with a large orange-coloured callosity; column acuminate. June. *h.* 1ft. La Guayra, 1840. (B. M. 4219.)

C. cristatum (crested). *fl.* greenish; perianth spreading; lip opened out, saccate, crested. August. *h.* 2ft. Brazil, 1823. (B. R. 966.)

FIG. 383. CATANANCHE CÆRULEA.

C. maculatum (spotted).* *fl.* green, spotted with purple, two inner calycine segments spotted; lip ciliated. September. *h.* 3ft. Mexico. (B. R. 26, 62.)

Catasetum—*continued.*

C. Naso (nose-like-lipped). *fl.* white, purple; sepals oblong-lanceolate, complicate, equal to the ascending lanceolate petals; lip hemispherical, drawn out into an abrupt ovate fleshy blunt appendage at the apex, lacerated at the base; spikes short, erect. August. *h.* 2ft. Mexico, 1843.

C. ochraceum (reddish-yellow). *fl.* yellow; sepals and petals ovate, secund; lip cucullate, entire, smooth, contracted into a short, broad, blunt, fleshy beak at the apex. Brazil, 1844.

C. Russellianum (Russell's).* *fl.* greenish; lip membranous, inflated in front, contracted at the mouth, the inner margin drawn out, undulated and fringe-crested in the disk. July. *l.* broad, lanceolate. *h.* 3ft. Guatemala, 1838.

C. saccatum (pouched).* *fl.* very large and extraordinary; sepals and petals spotted with rich purple; lip bright yellow, thickly covered with crimson spots; it is bored, as it were, in the middle, by a narrow opening, which leads into a deep chamber or sac, which is not observed till the back of the lip is turned up. March. Demerara, 1840. (L. S. O. 41.)

C. scurra (dandy). *fl.* pale straw-colour or waxy white, fragrant. *l.* lively green, about 6in. long; bulbs about 1½in. long. Demerara, 1872. Very curious, and with a compact habit. (G. C. n. s. vii., p. 304.)

C. tabulare (table-formed-lip). *fl.* pale green. Guatemala, 1843.

C. tridentatum (three-toothed). *fl.* yellowish-brown; two inner sepals spotted; lip galeate, three-toothed. April. Trinidad, 1822.

CATCHFLY. *See* **Silene.**

CATECHU. *See* **Areca Catechu.**

CATERPILLARS, WEB-FORMING. *See* **Hawthorn Caterpillars.**

CATESBÆA (founded by Linnæus, in honour of his contemporary, Mark Catesby, author of "Natural History of Carolina"). Lily Thorn. ORD. *Rubiaceæ.* Stove evergreen glabrous shrubs, bearing supra-axillary, simple spines. Flowers axillary, solitary; corolla funnel-shaped, with a very long tube, gradually widening and dilated to the throat, and a four-parted limb. Leaves small, oval, usually in fascicles. These are very ornamental plants while in bloom. They grow best in a mixture of light turfy loam and peat. Cuttings will root in April, if planted in sand, and plunged in heat, with a bell glass placed over them. Insects often infest these plants and considerably impair their beauty; therefore, necessary precautions should be taken.

C. latifolia (broad-leaved).* *fl.* pendulous; tube of corolla very long, obconical at the apex; pedicels one-flowered. June. *l.* obovate, shining, convex, rather shorter than the spines. *h.* 4ft. to 5ft. West Indies, 1823. (B. R. 858.)

C. parviflora (small-flowered). *fl.* erect; corolla with a tetragonal tube, about four lines long, sessile among the leaves. June. *l.* ovate, stiff, with revolute margins, mucronate. *h.* 4ft. to 5ft. Jamaica, 1810.

C. spinosa (spiny). *fl.* pendulous; corolla pale yellow, 3in. to 6in. long. May. *l.* ovate, acutish at both ends, rather longer than the spines. *h.* 10ft. to 14ft. Bahama Islands, 1726. (B. M. 131.)

CATHA (a name of Arabian origin). ORD. *Celastrineæ.* A monotypic genus. Flowers small; cymes short, axillary, dichotomously branched. Leaves opposite, petiolate, lanceolate, leathery, serrated. For culture, *see* **Celastrus.**

C. edulis (edible). Cafta or Khât. *fl.* white. *h.* 10ft. Yemen, Arabia. The green leaves of this tree are eaten with avidity by the Arabs, and possess nearly the same qualities as opium. Greenhouse or cool conservatory. SYN. *Celastrus edulis.*

CATHARTIC. *See* **Purgative.**

CATHCARTIA (in honour of J. F. Cathcart, Esq., B.C.S., Judge of Tirhoots). ORD. *Papaveraceæ.* A very pretty herbaceous biennial, thriving well in any light rich soil, if the situation is sheltered and sunny. Increased by seeds, which it produces freely.

C. villosa (hairy). *fl.* rich yellow, with numerous brown anthers, about 2in. across. June. *l.* vine-shaped, 3in. across, densely villose. *h.* 1ft. Sikkim-Himalaya, 1850. (B. M. 4596.)

CATKIN. A deciduous spike, consisting of unisexual apetalous flowers. An amentum.

CATMINT. *See* **Nepeta.**

CATOBLASTUS (from *kato*, beneath, and *blastos*, growth, in allusion to the aërial roots). ORD. *Palmeæ.* A small genus of two or three stove palms, closely allied to *Iriartea*, but differing from that genus in the male and female flowers being borne on separate spikes, the males having a small rudimentary ovary in addition to the nine to fifteen stamens; whilst the females have scarcely any rudimentary stamens. Trees having, in their native habitats, trunks from 30ft. to 50ft. high, distinctly marked with circular scars, supported, a short distance above the level of the ground, upon a tuft of aërial roots, and bearing a crown of pinnate leaves. The undermentioned is the only species in cultivation. For culture, *see* **Iriartea.**

C. præmorsus (bitten off).* *l.* impari-pinnate; leaflets simple. Venezuela, 1850. SYN. *Iriartea præmorsa.*

CATOPSIS (from *kato*, beneath, and *opsis*, appearance). ORD. *Bromeliaceæ.* A small genus of stove herbaceous plants, formerly included under **Tillandsia** (which *see* for culture).

C. nitida (shining). *fl.* white, remotely disposed in rather long slender spikes; corolla deeply three-parted; scape cylindrical. *l.* few, lingulate, convolute, forming below a hollow tube, which is swollen or ventricose at the base; very shining dark green. Jamaica, 1823. SYNS. *Tillandsia nitida* and *Tussacia nitida.* (H. E. F. 218.)

CAT'S TAIL. *See* **Typha.**

CAT'S-TAIL GRASS. *See* **Phleum.**

CAT THYME. *See* **Teucrium Marum.**

CATTLEYA (named in honour of William Cattley, Esq., of Barnet, Herts, a famous patron of botany, and one of the most ardent collectors of rare plants of his day). ORD. *Orchideæ.* A magnificent evergreen genus, which occupies the first rank in the estimation of orchid growers, both on account of the great size of the flowers—often 7in. or 8in. across—and also from their rich and varied colours. In addition to these qualifications, they are, with one or two exceptions, extremely easy to manage. This genus has much in common with *Lælia*, from which it is technically distinguished by possessing four pollinia or pollen masses, instead of eight. The flower-scape, which is enclosed in a sheath, rises from the top of the pseudo-bulb, a single spike sometimes containing nine perfect flowers, and occasionally many more, which last a considerable time in beauty. They vary considerably in size; for, whilst some species make pseudo-bulbs only some 2in. or 3in. long, others reach as many feet in height, forming, in a natural state, huge masses several yards in diameter. They all form pseudo-bulbs, which are more or less stout in the different species, and usually bear a single, dark green, coriaceous leaf upon the apex. One division of the genus produces two leaves upon the summit of the pseudo-bulbs, and sometimes, but more rarely, three are developed. Generally speaking, however, the largest-flowered species are to be found among those with single leaves. We have now many varieties which have been produced by hybridising, and these, both for size of flower and the marvellous beauty of their markings, may vie with the choicest of the introduced kinds. Many of these plants thrive best when attached to a block of wood—with a little sphagnum—suspended from the roof; pot culture, however, for those which attain any considerable size, will be best, as they will not only if grown in this manner produce the finest blossoms, but will require less care and attention at the hands of the cultivator. For potting material, use good fibrous peat from which all the gritty part has been well beaten; add to this some chopped living sphagnum, and some clean, sharp silver sand. Thorough drainage is most essential; and, in potting, let the plant sit upon the top of the soil, which should be elevated somewhat above the rim of the pot, in order to carry the water away quickly. Cattleyas like a genial, moist atmosphere, and an abundant supply of water during the growing season, which should be administered from the watering can; for, in the case of those plants grown in pots, it has been frequently remarked that, where regularly syringed, they neither grew

Cattleya—*continued.*

nor flowered so well. When grown suspended from the roof upon blocks of wood, there is nothing to fear from the syringe, because the water is not so likely to lodge in the large sheathing scales which envelop the young growth. This, however, may easily occur to those in pots, and is very detrimental to the miniature pseudo-bulbs. The syringe should not be depended upon entirely as a supply to those plants grown upon blocks; but, during summer, they should be carefully taken down, two or three times a week, and immersed in a tub or pan of water, which should be at least of the same temperature as the house they are growing in. After the pseudo-bulbs are formed, water must be withheld, and the plants allowed a season of rest; but care should be taken to prevent them becoming exhausted during this period, as much injury may arise if the withholding of water be carried to excess. A long season of rest will cause the plants to flower more freely, and to grow more vigorously afterwards. In our enumeration of the best species and varieties, we have derived considerable information from the works of Lindley, Warner and Williams, &c. New and distinct hybrids are constantly produced.

C. Aclandiæ (Acland's).* *fl.* twin; sepals and petals usually chocolate-brown, barred with irregular transverse bands and streaks of yellow; lip large, spreading, varying from rich rose to almost deep purple; base of lip too narrow and too spreading to cover the column. July. *l.* ovate, coriaceous, dark green. Pseudo-bulbs slender, 5in. to 6in. high. Brazil, 1839. (B. M. 5039.)

C. amethystoglossa (amethyst-tongued).* *fl.* about 5in. in diameter; sepals and petals rosy-lilac, beautifully spotted and blotched with purple; lip wholly of a rich deep purple or amethyst hue; scape erect, many-flowered. March to May. *l.* dark green, leathery, borne upon the apex of the pseudo-bulbs. *h.* 2ft. to 3ft. Brazil, 1862. (B. M. 5683.) The variety *sulphurea* is very pretty, with the ground colour of the flower pure yellow, and spotted, as in the type; lip broad, of a rich cream-colour. 1866. (G. C. 1866, 315.)

FIG. 384. FLOWER OF CATTLEYA BICOLOR.

C. bicolor (two-coloured).* *fl.*, sepals and petals of a peculiar brownish-green hue; lip long, narrow, of a rosy-purple colour, which becomes paler towards the margin; spikes eight to ten-

Cattleya—*continued.*

flowered. September. *h.* 1½ft. to 2ft. Brazil, 1837. In the best varieties, it is rich magenta, with an interrupted white-fringed margin; the blossoms have the fragrance of the garden Pink. See Fig. 384. (B. M. 4909.)

C. chocoensis (Choco).* *fl.* large, not fully expanded like the majority of this genus, somewhat campanulate in shape; sepals and petals pure white, broad, more or less fringed at the edges; lip yellow, stained in front with rich purple. Pseudo-bulbs bearing a single oblong, stout leaf. Choco, New Grenada, 1873. (I. H. n. s. 120.)

C. citrina (citron-flowered).* *fl.* of a bright uniform lemon-yellow colour, most deliciously perfumed, solitary, from the latest developed pseudo-bulbs, of a stout and waxy consistence. May to August. *l.* from 6in. to 10in. long, and about 1in. broad, pale glaucous. Pseudo-bulbs small, oval, covered with a silvery membrane when young; two or three-leaved. Mexico, 1838. This beautiful species is generally grown upon a block of wood, with just a small portion of sphagnum; but we have seen it well grown in pans, just like any other Cattleya; the atmosphere should be moist and the temperature very cool. See Fig. 385. (B. M. 3742.)

C. crispa (curled).* *fl.* 4in. to 5in. across; sepals and petals white, or white suffused with lilac; lip crimson velvet, with a narrow white crisp margin; spikes strong, frequently four or five-flowered. July, August. Pseudo-bulbs clavate, from 12in. to 14in. high, one-leaved. Brazil, 1826. (B. M. 3910.) The variety *superba* is a magnificent one, with a rich crimson and beautifully-fringed lip.

C. Dawsoni (Dawson's).* *fl.* 6in. or 7in. in diameter; sepals and petals delicate rosy-purple; lip large, the upper part straw-colour or yellow, the rest of a beautiful roseate hue, and the margin fringed; clusters three or four-flowered. *l.* dark green, of unusual thickness. *h.* 1ft. Brazil, 1863. (W. S. O. 16.)

C. Devoniana (Devon).* *fl.* upwards of 5in. in diameter; sepals and petals white, tinged with pink, which becomes deeper towards the points; lip deep rosy-purple. September. *l.* in twos, 6in. or 8in. long. A beautiful hybrid.

C. dolosa (deceptive).* *fl.* beautiful pink; lip with a yellow disk. *l.* twin, 4in. long, 2½in. broad, oval. Pseudo-bulbs 5in. or 6in. long. A pretty novelty. (G. C. n. s., v., 430.)

C. Dominiana (Dominy's).* *fl.* 6in. in diameter; sepals and petals white, delicately shaded with pink; lip rosy-purple, edged with white, and deep orange in the throat. A very fine hybrid. The variety *alba* has pure white flowers, with a lip having a lilac blotch in the centre; *lutea* has delicate blush flowers, and the lip white in front, suffused with yellow, the disk yellow, streaked with rose.

C. Dowiana (Dow's).* *fl.* very large; sepals and petals of a bright nankeen colour; lip large and spreading, beautifully frilled on the margin, and wholly of an intense rich purple, shaded with violet rose, and beautifully streaked with lines of gold; scape five or six-flowered. Autumn. It produces stout pseudo-bulbs, and leaves about 1ft. high. Costa Rica, 1866. This species is best grown in baskets, as near the light as possible; it also requires more heat than is usually allowed to Cattleyas. (B. M. 5618.)

C. eldorado (El Dorado).* *fl.* large; sepals and petals pale pink; lip of same colour outside, purplish-crimson towards the front, and stained with orange in the throat, serrated at the edges. August, September. This rare and beautiful species has pseudo-bulbs, which support a single, large, deep green leaf. Central America, 1869. The variety *splendens* is very superior; sepals and petals clear rose, the latter much broader and serrated at the edges; lip large; throat rich deep orange, succeeded by a circle of white, which is again followed by rich violet-purple, extending to the front and round the whole margins, where it is finely serrated. Rio Negro, 1870. (I. H. 1870, 7.)

C. exoniensis (Exeter).* *fl.*, sepals and petals soft rosy-lilac; lip very large, of an intense rich shining purple, with a white marginal border, the throat being suffused with rich golden yellow. A very splendid hybrid between *C. Mossiæ* and *Lælia purpurata*. (F. M. 269.)

C. gigas (giant).* *fl.* very large; sepals and petals pale rose; lip large and broad, rich deep purple or crimson-violet in front, and having two conspicuous eye-like yellow blotches at the base; scape four or five-flowered. April and May. Tropical America, 1873. (G. C. n. s. 17, p. 343.)

C. g. Sanderiana (Sander's). A very handsome variety, remarkable for the large spreading lip, of a rich amethyst, grained with white. 1883.

C. granulosa (granulated-lipped).* *fl.* olive-coloured, with rich brown spots, large; lips whitish, spotted with crimson. August, September. Guatemala, 1841. (B. R. 28, 1.)

C. guatemalensis (Guatemalan).* *fl.* produced in large clusters; sepals and petals rosy-purple and buff; lip red-dish-purple and orange, with a few crimson lines. Guatemala, 1861. Distinct and pretty

Cattleya—*continued.*

FIG. 385. CATTLEYA CITRINA.

C. guttata (spotted).* *fl.*, sepals and petals green, tinted with yellow and dotted with crimson; lip white, stained with purple; scape erect, five to ten-flowered. October and November. *l.* twin, coriaceous, dark green, growing upon the apex of the pseudo-bulbs. *h.* 1½ft. to 2ft. Brazil, 1827. (B. R. 1406.)

C. g. Leopoldii (Leopold's).* *fl.* very fragrant, and more numerous than those of the type; sepals and petals deep chocolate, with dark red spots; lip wholly of a rich red-purple. Brazil. (F. d. S. 14, 1471.)

C. g. Russelliana (Russell's).* A beautiful variety, from the Organ Mountains; it is altogether a taller and larger plant, with much handsomer and darker flowers. 1838. Very rare. (B. M. 3693.)

C. Harrisoniæ (Harrison's).* *fl.* of a beautiful rose-colour; lip slightly tinged with yellow. July to October. *h.* nearly 2ft. Brazil. A noble free-flowering species. The variety *violacea* has beautiful violet flowers; lip of the same colour, with a little yellow in the centre. (P. M. B. 4, 247.)

C. intermedia (intermediate).* *fl.*, sepals and petals soft rose or rosy-purple; lip of the same colour, blotched in front with deep violet-purple. May to July. *h.* 1ft. Brazil, 1824. (B. M. 2851.) There are several varieties of this most useful species, the best two of which are the following:

C. i. superba (superb).* *fl.* four to six on a spike; sepals and petals of a delicate rose; lip broad, rich purple. Brazil.

C. i. violacea (violet). *fl.* often nine on a spike; sepals and petals delicate rose colour; lip with a rich purple spot in the centre. May and June. Brazil.

C. labiata (lipped).* *fl.* large, 6in. or 7in. in diameter, three or four on a spike; sepals and petals of a deep rose colour, the latter being beautifully waved, very broad; lip large, somewhat hooded, the front portion being of an intense deep velvety-crimson. Late autumn. *l.* solitary, broad, leathery, dark green. *h.* 1½ft. to 2ft. Brazil, 1818.

C. l. pallida (pale). *fl.*, sepals and petals light pink; lip crimson, beautifully fringed. August. *l.* upright, of a lighter green than the type. Brazil.

C. l. Pescatorei (Pescatore's).* *fl.*, sepals and petals light rose-colour; lip rich crimson. A very beautiful variety, with light green foliage and free-blooming habit.

C. l. picta (painted).* *fl.* large, very handsome when well expanded, and often measuring 7in. across; sepals and petals pure white; lip of the richest crimson, and beautifully fringed. June, July. *h.* 1ft. The flowers are but sparingly produced, and are often deformed.

C. Lemoniana (Lemon's). *fl.* pale pink, with yellow in the centre of the lip. Summer. *l.* light green. *h.* 1ft. Brazil, 1842. Very close to *C. Mossiæ*. (B. R. 32, 35.)

C. lobata (lobed). *fl.* deep rich rose. May, June. Brazil, 1847. A charming species, much like *C. crispa* in growth, but shorter, both in bulb and leaf. It is rarely seen, on account of its very shy-flowering propensities. (G. C. 1848, 403.)

C. Loddigesii (Loddiges'). *fl.* three or four on a spike; sepals and petals pale rose colour, tinged with lilac; lip light rose, marked with yellow. August, September. *h.* 1ft. Brazil, 1815. (L. B. C. 37.)

C. marginata (margined).* *fl.* large, delicately perfumed, usually solitary; sepals and petals rosy-crimson; lip deep rose, margined with white. September and October. Pseudo-bulbs slender, seldom exceeding 6in. in height, and bearing upon the apex a single oblong light green leaf. Brazil, 1843. A rather shy and slow-growing species, of which there are many beautiful varieties. It grows best when suspended from the roof of the house, on a block of wood, with a little sphagnum. (P. M. B. 10, 265.)

C. maxima (large).* *fl.* rose-coloured throughout, of a pale hue when they first expand, which gradually becomes deeper; lip very large, almost white, beautifully ornamented with dark purplish-crimson veins, and streaked in the centre with orange colour; spikes many-flowered. Winter. Its main peculiarities consist in its long-channelled pseudo-bulbs, and its very convex, waxy petals. *h.* 1ft. to 1½ft. Columbia, 1844. (B. M. 4902.) There are several varieties of this species.

C. McMorlandii (McMorland's). *fl.* about 6in. in diameter; sepals and petals beautiful light rose; lip yellow and fringed. June, July. *l.* dark green. *h.* 1ft. Brazil.

C. Mendelli (Mendell's).* *fl.*, sepals and petals varying from white to a light pink, large and broad; lip large, of a rich magenta colour. April and May. South America. A very fine species, of recent introduction.

C. M. Selbornensis (Selborne's). A splendid variety, with large flowers; lip very richly coloured; petals and sepals of a beautiful rosy-purple.

C. Mossiæ (Moss's).* *fl.* 5in. or 6in. across, sometimes more; although they vary very much, the sepals and petals are usually of some shade of blush or deep rose; lip large, of the same colour, in most instances beautifully fringed or crimped round the edge; scape three to five-flowered. May, June. *l.* solitary, dark, shining green, borne upon the apex of the stout pseudo-bulbs. *h.* 1ft. La Guayra, 1836. (B. M. 3669.) Without exaggeration, this species may be said to rank among the most magnificent of orchids in cultivation. The varieties are extremely numerous, and, in many instances, very distinct. Mr. Williams describes nearly thirty; but the major number of these are very rare, and perhaps not a few unique. The following selection comprises the principal ones:

C. M. aurantiaca (orange).* A very handsome variety, remarkable for the deep orange hue of the centre of the labellum. Venezuela.

C. M. aurea (golden). *fl.* small; sepals and petals blush, less spreading than in most other forms; lip small, strongly marked with buff-orange at the base, extending forward at the front edge, and having broken violet-rose lines in the centre, surrounded by a very broad pale margin, which is almost white inwards, and tinged with blush on the extreme edge.

C. M. a. grandiflora (large-flowered).* *fl.* large; sepals and petals blush; lip marked with a bar and a few broken lines

Cattleya—*continued.*

of violet-rose, very much stained with orange at the base, and towards the upper part of the margin.

C. M. grandiflora (large-flowered).* *fl.* large; sepals and petals blush, the latter less frilled than in some forms; lip of a deep rich purple-rose, slightly stained at the base with orange, and having a narrow even edge of pale blush.

C. M. grandis (grand).* The largest of all the forms in respect to the size of its lip; sepals and petals pale blush; lip mottled violet-rose, with an irregular blush-coloured edge; the base stained with buff-orange. A splendid plant.

C. M. Laurenciana (Lawrence's).* *fl.* large; sepals and petals blush, the latter very broad, and considerably frilled; lip large, rich deep violet-rose, slightly stained with orange in the interior, veined and mottled in front, with a narrowish and nearly even frill of blush.

C. M. majestica (majestic).* *fl.* very fine; sepals and petals broad, the latter measuring upwards of 9in. from tip to tip, and of a dark rose colour; lip large and spreading, having the edge beautifully fringed, ground colour dark rose, stained at the base with soft orange, and variously blotched and streaked in front with violet-purple. Pseudo-bulbs 3in. high, bearing a broad single leaf about 6in. long.

C. M. Marianæ (Marian's).* *fl.* small, but very distinct and chaste; sepals and petals white; lip with a bright yellow stain at the base, prettily mottled with violet-rose in the centre, and broadly and evenly margined with white. A very rare and beautiful form.

C. M. splendens (splendid). *fl.* large; sepals and petals blush; lip rich full purple-rose, with orange base, the margins blush, and very much frilled.

C. M. superba (superb).* *fl.*, sepals and petals dark blush, the latter narrow and very slightly frilled; lip large, prominently stained with deep orange at the base, the front part brighter, and the centre veined and somewhat mottled with violet-rose, leaving a broadish, irregular, pale margin.

C. M. Williamsii (Williams's). *fl.* large; sepals and petals blush white; lip finely mottled with rose, stained with orange at the base, and having a broad pale margin.

C. nobilior (nobler). *fl.* 5in. across, of a lovely deep rose-pink colour; lip conspicuously blotched with creamy-white on the front lobe. *l.* twin, ovate, thick, leathery. Pseudo-bulbs 4in. to 6in. long, cylindrical. Brazil, 1883. A species allied to *C. dolosa* and *C. Walkeriana*. (G. C. n. s., xix. 723.)

C. pumila (dwarf). *fl.* rose coloured, with a crimson lip, often edged with white. September. *h.* 6in. Brazil. A very pretty species. (B. M. 3656.)

C. quadricolor (four-coloured). *fl.*, sepals and petals light rose; lip of same colour, yellow on the upper part. May. New Grenada, 1865. Very rare and pretty. (B. M. 5504.)

C. quinquecolor (five-coloured). *fl.*, sepals and petals light olive-green, spotted with brown and dark chocolate; lip white, with a yellow blotch, veined with rose. A very pretty hybrid.

C. Regnellii (Regnell's).* *fl.* large, 3in. to 4in. in diameter; sepals and petals pale green, tinged with olive, and more or less spotted with rosy-purple; lip large, spreading; ground colour amethyst, tinged with rosy-purple, this is set off by a neat marginal border of white, whilst the throat is stained with yellow; scape erect, three to five-flowered. July, and again in September. *l.* twin, sometimes tern, thick, fleshy, dark green. Pseudo-bulbs usually about 4in. or 5in. high. Brazil. (W. S. O. ser. ii., 22.)

C. Schilleriana (Schiller's). A charming species, very like *C. Aclandiæ*, but with darker and rounder foliage; the flowers are also darker. Brazil, 1857. (F. d. S. 2286.)

C. Sedeniana (Seden's).* *fl.* large; sepals and petals light rose, shaded with green; lip with a white fimbriated margin, centre purple, with darker veins. A very handsome hybrid.

C. Skinneri (Skinner's).* *fl.* rosy-purple, very slightly tinged with purple; base of lip white; the column is shorter than in most of the species. April and May. *l.* twin, fleshy, light green. Pseudo-bulbs 12in. to 18in. high. Guatemala, 1836. An old, but still eminently useful, species. (B. M. 4270.)

C. speciosissima (showiest).* *fl.* large, often 8in. in diameter; sepals and petals broad, soft flesh-colour, the latter broadest, with erose edges; the lip forms a circle, through closing over the column, the front portion being of an intense amethyst colour, varied with white and yellow markings towards the centre, where

Cattleya—*continued.*

are also several lines of bright amethyst; spike rather short, three or four-flowered. *l.* ovate, shining. Pseudo-bulbs oblong, deeply channelled. Venezuela, 1868.

C. superba (superb). *fl.* deep rose, with a rich crimson lip; spikes three or four-flowered. June. *h.* 10in. Guiana, 1838. A very handsome but slow-growing species. The variety *splendens* has much larger flowers, and the lip is white at the base, rosy-violet in front, and with several lines of golden yellow towards the middle.

C. Trianæ (Triana's).* *fl.* several inches in diameter; sepals and petals usually blush; lip blush, or pale rose outside; throat orange or yellow, front rich purple, more or less intense; scape many-flowered. Winter. Cordilleras of Quindiu, 1856. This is an extremely variable species, and consequently varieties are numerous. See Fig. 386.

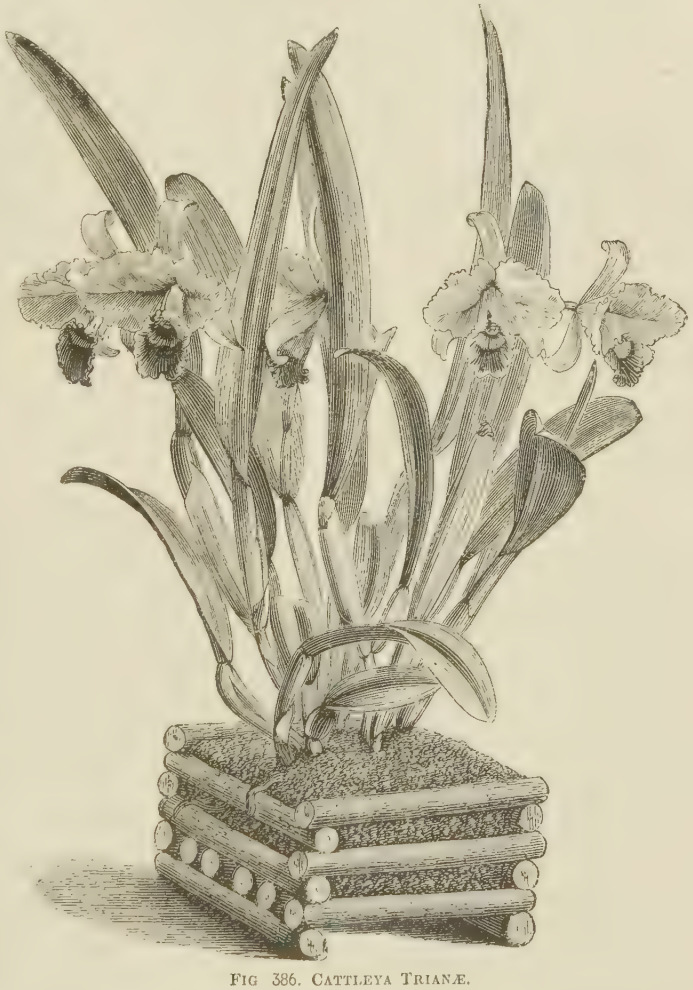


FIG 386. CATTLEYA TRIANÆ.

C. T. Atalanta (Atalanta). *fl.* white, shaded with rose; petals broader and more pointed than the sepals; lip about 3in. long, pale rose, with a broad band of orange in the throat.

C. T. Colemanii (Coleman's).* *fl.* 8in. across; sepals and petals tipped with rose; throat elegantly striped with various shades of yellow; lip deep rose, well fimbriated. 1875.

C. T. Dodgsonii (Dodgson's). *fl.* white, 8in. to 9in. in diameter; lip deep crimson; throat orange-yellow.

C. T. Hilli (Hill's).* *fl.* pure white, large, very distinct; lip rich magenta; throat yellowish.

C. T. Io.* *fl.* as large as those of the variety *Hilli*; sepals and petals clear rose; petals finely serrated at the margins; lip large, rich deep purple, shaded with violet; an orange throat and marginal band of rosy purple; edges finely crisped.

Cattleya—*continued.*

C. T. Russelliana (Russell's). *fl.*, sepals 3½in. long, more than 1in. broad; petals white, tinged with rose, upwards of 2in. broad, waved at the edges, and recurved; lip 3in. long, basal part rose, but rich deep rosy-purple in front, shaded with violet; the centre of the lip and throat bright orange, and the edge finely curled.

C. T. velutina (velvety).* *fl.* very fragrant; sepals and petals pale orange, spotted and streaked with purple; lip orange at the base, white, with violet veins in front, where the surface is velvety. Brazil, 1870. This pretty form resembles *C. bicolor* in growth.

C. tricolor (three-coloured). *fl.*, sepals and petals creamy-white; lip same colour, with a yellow throat and a band of carmine near the margin. 1883. A very distinct species, having flowers about the size of *C. Skinneri*.

C. tuberosa (tuberose). Synonymous with *C. Walkeriana*.

C. Wageneri (Wageneri's).* *fl.* snow-white, excepting a stain of rich yellow in the centre of the lip, the margin of which, as of the petals, is beautifully divided. June. Caraccas, 1851. In habit, this species is like a rather slender form of *C. Mossiæ*. (R. X. O. 1, 13.)

C. Walkeriana (Walker's).* *fl.* rose-coloured, 5in. across, very sweet-scented; lip richer rose, with a slight tinge of yellow; scape usually two-flowered. *h.* 4in. Brazil, 1844. An elegant dwarf species, best grown on a block of wood suspended from the roof, allowing it plenty of light, but not too much sun. SYN. *C. tuberosa*. (P. F. G. 3.)

C. Warneri (Warner's).* *fl.* about 6in. across; sepals and petals broad, deep rose colour; lip large, with its middle lobe much expanded, of deep rich crimson, ornamented in front with an elegant marginal fringe; scape many-flowered. Brazil, 1862. A robust and fine species, much resembling *C. labiata* in habit. (W. S. O. 8.)

C. W. delicata (delicate). *fl.* white, 6in. across; lip large, with a beautiful yellow centre and tinge of rose, white on the outside. (W. S. O. 4.)

C. W. d. superba (superb)* is a splendid form, with very large and finely expanded lip, and broad pure white sepals and petals.

C. W. sudburyensis (Sudbury). A splendid variety, with an unusually large lip of rich amethyst-purple, edged with a frilling of white, and also white in the throat. 1883.

C. Warscewiczii (Warscewicz's).* *fl.* large; sepals and petals purplish-white; lip rich crimson. Winter. *l.* light green. *h.* 1ft. New Grenada, 1867. (R. X. O. i, 31.)

CAUDATE. Tailed; having a process like a tail.

CAUDEX. The axis of the plant. Generally applied to the trunk or stem of palms and ferns.

CAUDICLE. The cartilaginous strap which connects certain kinds of pollen masses to the stigma.

CAULESCENT. Acquiring a stem; having a kind of stem.

CAULIFLOWER. A garden variety of *Brassica oleracea*, in which the inflorescence, while young, is condensed into a depressed, fleshy, edible head. This differs from Broccoli in being more tender, of finer flavour, and in use more as a summer and autumn vegetable. When at its best, a Cauliflower should have a close head (see Fig. 387), and be free from caterpillars. To attain these points, rich soil, and frequent hand-picking—should caterpillars put in an appearance—are requisite. Deeply-worked soil is also necessary; in fact, with no other crop of the *Brassica* tribe is this more important than with the Cauliflower.

Cultivation. Cauliflowers may be divided into two sections: Spring-sown and Autumn-sown. The latter is, perhaps, the more important, as the crop comes from them in spring and early summer, when they are sure to be expected and are always appreciated.

Sow seeds for succession in February and March, on a gentle hotbed, and afterwards in the open ground. As soon as the plants are large enough to handle, prick them out in a warm place under hand lights, or in a frame, with a little bottom heat in the case of the earlier sowings, until of sufficient size to plant out finally. It is not advisable to sow later than May for autumn supplies, as the season is not of sufficient length afterwards for the crop to be ready for use before frost comes. The results are not always certain, especially in a dry summer, a large percentage of the plants being liable to "button," or produce their heads prematurely. If, however, smaller successional plantings are made, the loss of, maybe, the majority of any one will not be so much felt. The plants

Cauliflower—*continued.*

will require a distance of 2ft. each way, and they should be kept watered, if possible, in dry weather. The earlier batches should be planted where there is shelter, such as single lines between Asparagus beds, or between rows of early Peas, if the latter are wide enough apart to admit plenty of light.

To obtain plants to stand the winter, sow in August, or early in September, and, as soon as they are large enough,

FIG. 387. CAULIFLOWER.

prick out about 4in. apart, in cold frames, keeping them about 6in. from the glass. Allow the plants all the air possible, but not too much rain, or they will become sappy, and not able to stand the cold of winter. At the approach of frost, put on the sashes, and, in severe weather, apply coverings of dry litter, fern, or some other non-conducting material. Hand lights, protected in a similar way, may also be used to preserve the plants through the winter. Give plenty of air at all times when there is no frost; and on mild, dry days, throw off the lights altogether, the object being to make the plants as hardy as possible. In March or April, transplant to a warm south border, taking the state of the weather into consideration. It will still be necessary to protect with hand lights, if possible, or by some other means. A good plan is to place at distances four plants within the area of a hand light, and remove the latter on all favourable occasions. Keep the soil stirred around the plants, and, as the season advances, plenty of water and an occasional dose of liquid manure will be of great advantage. Should the crop come in too rapidly, cut the heads so soon as they are ready, and place them on the floor of a cool shed or cellar, where they will keep for several days. Cauliflowers should be cut before the white heads are exposed to the sun and light, or they will quickly open and become partially green, thereby injuring the quality.

Sorts. Distinct sorts are somewhat limited, but their synonyms are numerous. The best for autumn sowing are Early Erfurt, Early London, and Walcheren. These may also be sown in spring; other good varieties for sowing at this season are Large Asiatic, Lenormand's, Dwarf Mammouth, and Veitch's Autumn Giant.

CAULINE. Of, or belonging to, the stem.

CAULOPHYLLUM (from *kaulon*, a stem, and *phyllon*, a leaf; the stem seeming to form a stalk for the single, large, and compound leaf). ORD. *Berberideæ*. A distinct and interesting hardy tuberous perennial. It grows readily

Caulophyllum—*continued.*

in any ordinary light sandy soil. Propagated by divisions of the roots, made in early spring, or after flowering.

C. thalictroides (Thalictrum-like). *fl.* yellow, disposed in a loose raceme. April. *l.*, stem leaf solitary; petiole divided to the base into three parts, each part bearing three ovate or obovate, deeply-cut, acuminated leaflets. *fr.*, berry deep blue, globose, contracted below into a long-stipitate base. *h.* 1ft. North America, 1755.

CAVENDISHIA. *See* **Proclesia.**

CEANOTHUS (from *keanothus*, a name employed by Theophrastus to designate a spiny plant, derived from *keo*, to cleave; however, the modern genus has nothing to do with the plant of Theophrastus). ORD. *Rhamneæ*. Hardy or half-hardy, smooth or pubescent shrubs. Flowers blue or white, very slender, disposed in terminal panicles or in thyrsoid cymes. Leaves alternate, serrated, three-nerved. Branches erect. They thrive in almost any soil, but prefer a light one, and a well-drained situation. The majority of the species are very elegant, and are particularly suited for covering walls with almost all aspects. They are mostly of free and neat growth. Propagation is effected either by cuttings, which should be inserted in sandy soil, in a cold frame, in autumn, or by layers, which is the readiest way of obtaining strong plants. A great number of species have been introduced, from time to time, but only a comparative few are generally grown, although all are well worth cultivating.

C. americanus (American).* New Jersey Tea. *fl.* white, small; thyrse elongated, axillary, with a pubescent rachis. June, July. *l.* ovate, acuminated, serrated, and pubescent beneath. North America, 1713. Hardy. (B. M. 1479.)

C. azureus (azure-blue).* *fl.* pale blue; pedicels smooth; thyrse elongated, axillary, with a downy rachis. April and May. *l.* ovate-oblong, obtuse, acutely serrated, smooth above, hoary and downy beneath. *h.* 10ft. Mexico, 1818. Hardy in most places. SYNS. *C. bicolor* and *C. cæruleus* (L. B. C. 110). (B. R. 291.) There is a very fine variety of this species, GLOIRE DE VERSAILLES, which is most desirable.

C. bicolor (two-coloured). A synonym of *C. azureus.*

C. cæruleus (blue). A synonym of *C. azureus.*

C. collinus (hill). *fl.* white, numerous. June, July. *l.* ovate or elliptic, somewhat clammy. *h.* 1ft. North America, 1827. Hardy.

C. cuneatus (wedge-shaped).* *fl.* pale blue, sometimes white, disposed in corymbose terminal heads. April. *l.* cuneate-obovate, or oblong, usually entire. *h.* 4ft. Upper California. SYN. *C. verrucosus.* Half-hardy. (B. M. 4660.)

C. dentatus (toothed).* *fl.* blue, in small roundish clusters, on naked peduncles about 1in. long. May and June. *l.* fascicled, obovate or oblong-elliptic, acute, the margins strongly undulate or revolute. *h.* 4ft. to 6ft. California, 1848. An erect, and usually nearly glabrous shrub. Hardy. SYN. *C. Lobbianus.* (B. M. 4810.)

C. divaricatus (straggling). *fl.* nearly white, or very pale blue, usually in nearly simple elongated racemes. June, July. *l.* oblong, or oblong-ovate, rounded at the base, obtuse or acute at the apex, both sides smooth. Branches spinose and straggling. *h.* 3ft. to 4ft. California and Oregon, 1848. Hardy.

C. floribundus (many-flowered).* *fl.* richest brilliant mazarine blue, densely crowded in globe-shaped heads. June. *l.* small, oblong, acute, serrulate, evergreen, shining. California. Hardy. (B. M. 4806.)

C. integerrimus (entire-leaved).* *fl.* usually white, arranged in large open panicles, terminating slender branches, or axillary upon shorter peduncles. June, July. *l.* ovate, or ovate-oblong, entire or rarely slightly glandular-serrulate. Branches slender, quite glabrous. *h.* 3ft. to 6ft. California, 1846. Half-hardy.

C. Lobbianus (Lobb's). A synonym of *C. dentatus.*

C. microphyllus (small-leaved). *fl.* white; corymbs stalked, loose, terminal. May, June. *l.* oblong, obtuse, entire, minute, sub-fascicled, smooth. Branches straight, somewhat decumbent. *h.* 2ft. North America, 1806. Hardy.

C. papillosus (pimpled). *fl.* blue, in dense clusters, on short racemes, terminating slender, naked peduncles. June. *l.* narrowly oblong, blunt at both ends, glandular-serrulate, and the upper surface is also glandular. *h.* 2ft. to 3ft. California, 1848. Half-hardy. (B. M. 4815.)

C. rigidus (rigid).* *fl.* rich purple-blue, in long terminal spikes. *l.* broadly cuneate, or obovate, often emarginate, slightly toothed. *h.* 5ft. to 6ft. California, 1848. Half-hardy. (B. M. 4664.)

C. Veitchianus (Veitch's).* *fl.* bright blue, disposed in dense clusters. *l.* thick, small, oblong-obovate, or oval, glandular-serrulate. California. Hardy. (B. M. 5127.)

C. verrucosus (warted). Synonymous with *C. cuneatus.*

CECROPIA (a classical name commemorating Cecrops, the first founder of Athens, which was primarily known as Cecropia). Snake Wood. ORD. *Urticaceæ*. Ornamental stove evergreen, soft-wooded, milky trees. They require a mixture of peat and loam, in a rough state, with the addition of a little sand. Propagated by cuttings, made of ripened shoots, in April, and inserted in sandy peat, with a bell glass over them, in a moist bottom heat.

C. peltata (peltate-leaved). *fl.*, male: receptacles numerous, shortly stipitate, in cylindrical spikes; calyx a turbinate, four-cornered scale. Female: receptacles less numerous and thinner than the male ones, sessile. *l.* large, peltate, seven to nine-lobed, hispid and rough above, white and downy beneath; lobes oblong, bluntish. *h.* 30ft. Jamaica, 1778. The fruits—four, five, or more—rise from the very top of a common peduncle, and shoot into so many oblong, cylindrical berries, composed of a row of little acini, something like the Raspberry, which they also resemble in flavour.

CEDAR, BARBADOS OR BERMUDAS. A common name for **Juniperus bermudiana** (which *see*).

CEDAR OF LEBANON. *See* **Cedrus Libani.**

CEDRELA (a diminutive from *Cedrus*, the Cedar; the wood having an aromatic scent like that of the Cedar-tree). Bastard Cedar. ORD. *Meliaceæ*. A genus of about a dozen species of large stove or greenhouse trees. Flowers whitish, small, in axillary and terminal panicles. Leaves abruptly pinnate, many-paired. They thrive well in rich loam. Large ripened cuttings will strike root in sand, under a hand glass, in heat.

C. odorata (sweet-scented). *fl.* whitish, flesh-coloured, resembling those of a Hyacinth. Summer. *l.*, leaflets ovate-lanceolate, entire, on short stalks. *fr.* about the size of a partridge's egg. *h.* 50ft. Caribbee Islands, 1739. Stove. The bark, berries, and leaves of some of the kinds smell like *Assa-fœtida*, when fresh.

C. sinensis (Chinese). China. Hardy. SYN. *Ailantus flavescens.* (R. H. 1875, 87.)

C. Toona (Toona). *fl.* white or pink, small, smelling like fresh honey. February to May. *l.*, leaflets lanceolate, acuminated, entire, pale glaucous beneath, deciduous. *h.* 60ft. India, 1823. Stove.

C. velutina (velvety). *fl.* whitish. *l.*, leaflets ovate-lanceolate, entire, smooth; petioles and branches velvety, from very short down. *h.* 50ft. India, 1793. Stove.

CEDRELEÆ. Formerly regarded as a distinct order; now included as a tribe of the natural order *Meliaceæ*. Flowers in panicles; petals four or five. Fruit a capsule opening by valves, which separate from a thick axis. Leaves alternate, pinnate, exstipulate. The genus best known is *Cedrela*; others are *Chloroxylon* and *Flindersia.*

CEDRONELLA (probably a diminutive of *kedros*, the Cedar; from the sweet odour of *C. triphylla*). ORD. *Labiatæ*. Half-hardy or hardy herbaceous plants. Whorls approximate into terminal spikes or racemes. Floral leaves bract-formed; bracts small, setaceous; corolla with an exserted tube, naked inside, a dilated throat, and a bilabiate limb. They thrive in a compost of sandy loam, leaf soil, and a little peat. The herbaceous species are propagated by division of the root, or by cuttings of young wood; *C. triphylla* by cuttings.

C. cana (hoary). *fl.* showy purple or crimson, disposed in numerous spikes. July. *l.* ovate-oblong, dentated, fragrant. *h.* 2ft. to 3ft. New Mexico, 1851. A very neat erect, hardy, evergreen species. (B. M. 4618.)

C. cordata (heart-shaped).* *fl.* light purple, in bracteate spikes; corolla twice as long as the calyx segments. May and June. *l.* ovate, cordate at the base, crenated, nearly sessile; shoots trailing. *h.* 4in. to 6in. Northern United States, 1880. Hardy. SYN. *Dracocephalum cordatum.*

C. mexicana (Mexican). *fl.*, corolla purplish, three times as long as the calyx; whorls many-flowered, approximating into a terete, interrupted spike or raceme. *l.* ovate-lanceolate, cordate at the base, toothed. *h.* 2ft. to 3ft. Half-hardy. Mexico, 1832. SYN. *Gardoquia betonicoides.* (B. M. 3860.)

C. triphylla (three-leaved).* Balm of Gilead. *fl.* white or pale purple, about twice as long as the calyx; whorls loose, collected into terete oblong spikes. July. *l.* ternate; leaflets oblong-lanceolate; emitting a very sweet odour when gently rubbed. *h.* 3ft. to 4ft. Canary Islands, 1697. Half-hardy shrub. SYN. *Dracocephalum canariense.*

CEDRUS (from Latin *cedrus*, Greek *kedros*, a name for a coniferous tree from the time of Homer). Cedar. ORD.

Cedrus—*continued.*

Coniferæ. Majestic evergreen trees, with large spreading branches, rigid, scattered and clustered leaves and erect oblong or oval cones rounded at the top; scales of the cones broad, thin, coriaceous, entire, closely appressed, at length deciduous. It is commonly supposed that a rich soil is needed for the Cedar, but this is only correct in a certain degree; a rich loam or sandy clay being, perhaps, the best. An open sub-soil is the most indispensable condition, as will be proved from their healthy state in natural mountainous regions. The Cedar does not like pruning, either in root or branch, and if the top is removed, the tree assumes the form of an enormous bush, of picturesque and grand proportions. Growing in its natural state, it takes a broad, conical form, till it reaches its full height, when the lateral branches begin to extend outwards, and the top then assumes a broad, flat surface. Cones seldom make their appearance on the Cedar of Lebanon before it attains forty years of age, and it has been known not to produce them before the tree was 100 years old. The catkins appear in autumn, and the cones require two years to arrive at maturity. The seeds are difficult to extract from the cones, which do not drop from the tree, but will hang for many years; nor does the influence of the sun cause them to shed the seeds. The cones have, therefore, to be gathered by April, and the seed immediately sown in pans. The seedlings must be planted out in the open nursery the following spring. The Cedar resembles other Coniferæ in the formation of its roots, which strike out a great distance, if not transplanted, and thus lose the advantage which is derived from a bushy root. It is of somewhat slow growth, but is often slower than is necessary, from defective management and an unsuitable situation. Several authorities are agreed in regarding the three species as mere varieties of one. In any case, from a garden standpoint, they possess quite sufficient characteristics to justify separate specific descriptions.

C. atlantica (Atlantic).* Very closely allied to *C. Libani*, but mainly differing in the foliage, which, in the present species, is shorter, usually less than 1in. long, and of a glaucous green or silvery hue. It is also of more erect pyramidal habit than the Cedar of Lebanon. *h.* 80ft. to 120ft. Atlas Mountains of Algeria, 1843.

C. Deodara.* Deodar or Indian Cedar. *l.* fascicled, acute, triquetrous, rigid, larger than those of *C. Libani*, and of a bluish but dark green, covered with a light glaucous bloom. One of the most beautiful members of Coniferæ, and having an elongated pyramidal or conical outline. Leading shoot and branchlets pendulous. *h.* 150ft. to 200ft. Western Himalayas, 1822. The best-known varieties are the following: *C. D. robusta* (sturdy) has coarser and larger leaves and thicker branches, and

FIG. 388. CEDAR OF LEBANON AND OTHER TREES FOR DRY SITUATIONS.

FIG. 389. BRANCHLET, SHOWING LEAVES AND CONE OF CEDRUS LIBANI.

Cedrus—*continued.*

C. D. viridis (green) or *tenuifolia* (thin-leaved) is of slender habit, with bright green foliage. Other forms mentioned in nurserymen's catalogues are: *argentea*, *alpo-spica*, *erecta*, and *verticillata glauca*.

C. Libani.* Cedar of Lebanon. *l.* tufted, short, rigid, dark green. Cones oblong, oval, pedunculate, purplish, but ultimately brown, 3in. to 4in. long; scales with a somewhat membranous margin. Branches horizontal, rigid, tubuliform, disposed in distinct whorls; branchlets flat, fan-like, very numerous and thickly set. *h.* 60ft. to 80ft. Lebanon and Taurus in Syria, 1683. This magnificent tree has well been called "The Patriarch of the Tribe." See Figs. 388 and 389. There is a form called *argentea* (silvery) which has highly glaucous foliage, and also a diminutive form, known as *nana*.

C. L. brevifolia (short-leaved). The Cypress Cedar. This distinct variety differs principally from the type in its much shorter leaves.

CELANDINE. *See* **Chelidonium.**

CELASTRINEÆ. An order of shrubs or small trees. Flowers in axillary cymes, small, green, white, or purple; sepals and petals four to five, imbricate. Fruit two to five-celled, capsular or drupaceous. Leaves alternate, rarely opposite, simple, stipulate. Well-known genera are: *Celastrus*, *Elæodendron*, and *Euonymus*.

CELASTRUS (from *Kelastros*, the old Greek name given by Theophrastus to the Privet). Staff-tree. ORD. *Celastrineæ*. Ornamental, hardy, greenhouse or stove, mostly evergreen shrubs. Flowers green or white, small, disposed in terminal racemes or panicles. Leaves alternate, entire, or serrated with minute prickles. The stove and greenhouse species thrive well in a mixture of loam, peat, and sand; and ripened cuttings will root freely in the same sort of compost if a hand glass is placed over them; those requiring stove temperature, should be placed in heat. The hardy species are well adapted for small shrubberies; they thrive in any common soil, and are easily increased by layering the young shoots in autumn. *C. scandens* is an excellent plant for covering bowers or trellis-work.

C. cassinoides (Cassine-like). *fl.* white; pedicels two or three together, axillary, very short. August. *l.* ovate, acute at both ends, serrated, permanent. Plant erect, smooth. *h.* 4ft. Canary Islands, 1779. Greenhouse.

C. edulis (edible). Synonymous with *Catha edulis*.

C. lucidus (shining).* *fl.* white; pedicels axillary, crowded, very short. April to September. *fr.* three-valved, naked. *l.* oval or roundish, shining, marginated. *h.* 1ft. to 3ft. Cape of Good Hope, 1722. Plant erect, smooth, evergreen. Greenhouse. SYN. *Cassine concava*.

C. scandens (climbing).* *fl.* pale yellow; racemes terminal. May, June. *l.* oval, acuminated, serrated, 3in. long, 2in. broad. Berries orange-coloured, three-cornered, three-seeded. North America, 1736. Plant hardy, deciduous, smooth, climbing.

CELERIAC, or **TURNIP-ROOTED CELERY** (*Apium graveolens rapaceum*). Biennial. A Turnip-rooted variety of the garden Celery. It is very useful for soups and similar purposes, is easy of cultivation, and tolerably certain as to producing a crop. The seed may be sown in the same way, and at the same time, as the ordinary Celery.

Cultivation. As soon as the seedlings are large enough, prick them off, about 3in. apart, in boxes or on a spent hotbed, and keep them there until they are of a good size, when they should be planted out about 1ft. apart in the open ground. They should have air to prevent them "drawing," and be gradually hardened off before planting. The soil can scarcely be too rich, and must be given plenty of water during the summer. Unlike the ordinary Celery, this variety (see Fig. 390) does not require trenches, as the tops are seldom used. All lateral shoots and side roots should be removed from the tubers during the summer, if good large specimens are desired. Occasional hoeings and plenty of water will be the most that is necessary in after cultivation. The roots will be ready for use in autumn, and may be stored in a shed, or lifted from the ground when required for use. A little protection will be necessary if the latter plan is adopted. This crop materially helps the ordinary Celery, both for flavouring purposes and for separate dishes.

FIG. 390. CELERIAC, or TURNIP-ROOTED CELERY.

CELERY (*Apium graveolens*). Hardy biennial, a native of Britain. Found in a wild state growing in wet ditches and marshy situations. This important

FIG. 391. CELERY.

and extremely popular vegetable (see Fig. 391) requires, and well repays for, special attention in its cultivation. One of the most open and best positions in the garden should be selected for this crop, and the best farmyard manure that can be obtained should be dug into the

Celery—*continued.*

trenches before planting. Another condition absolutely necessary is a plentiful supply of water throughout the growing period, withholding it as soon as the earthing up is completed. If this is neglected, the plants are more liable to "bolt," or prematurely run to seed. Medium-sized heads are generally much more solid than very large ones; consequently, they should be preferred, the latter being often hollow-stalked and useless for any purpose. Celery, when sent to table, should be quite solid and crisp, well blanched, and of a sweet, nutty flavour. A great deal depends on the earthing up and cultivation as well as the variety grown. The soil is best to be rather light, and, if possible, free from large lumps, as it can then be worked much easier round the stems without displacing them, and will at the same time exclude light better, and so hasten the blanching.

Cultivation. At the beginning of March, sow a small quantity of seed for an early supply, and at the end of April, make the main sowings, placing the seed thinly in boxes of light soil. Water carefully, and place the boxes on a mild hotbed, or in a vinery or other warm glass house. The seeds take a rather long time to germinate. A little air must be admitted so soon as the seedlings are up, to keep them dwarf, and water must be carefully applied. So soon as the plants are large enough to handle, prick out, about 4in. apart, in other boxes, or into a frame where there is a little dung heat. Keep well watered, and gradually harden off before planting out. The early batch should be out by the end of May, and the main crop in June, planting all in properly prepared trenches, supposing this system is adopted.

There are various ways of growing Celery, some planting in trenches, in single or double lines, and others growing it in beds. The single line in trenches allows the plants plenty of light, and it is much easier and better to earth them up; consequently, this plan has much to recommend it. In the case of some of the small-growing varieties, or where space is limited, one of the other plans might be preferred; but care must be taken to keep the stems quite straight when earthing up. For single line, mark out trenches 4ft. to 5ft. from centre to centre, digging them about 15in. wide and from 9in. to 1ft. deep, and place the soil in the intervening spaces, which may be utilised for some other vegetable that does not require a long season of growth, such as lettuces, early cauliflowers, &c. The crop from these would be cleared off before the soil would be required for the Celery. In the bottom of the trenches, place a thick layer of rotten manure, and lightly dig it in Apply a heavy drenching of water, and a day or two afterwards put in the plants, about 1ft. asunder, along the centres of the trenches, again well watering in. Be careful that each plant has a good ball of earth adhering to the roots when taken up, and plant with a trowel.

The after cultivation consists primarily in supplying plenty of water in all but showery weather, and in keeping clear from weeds. When the plants are 1ft. high, fill in sufficient soil to cover any roots that may be on the surface, after which no more earthing will be needed till August or the beginning of September, excepting in the case of the earliest crops, which will have been more forward at all stages. Remove all lateral shoots from the base, and earth up when the foliage is dry, keeping the soil each time below the middle leaves or crown of the plant. The best plan is to have a boy holding the stems and leaves together, while someone with a spade places the soil around the plants, or a piece of matting may be tied round each plant and removed when the work is finished. Earthing should be completed in about three stages, proceeding by the same method each time. When frost sets in, cover the ridges with about 6in. of dry litter, or something of a similar description, and a good plan is to lay a couple of 9in. boards, nailed at right angles, over the litter, to keep out

Celery—*continued.*

rain and snow water. Should Celery be taken up when frozen, a condition that should be avoided if possible, it must be submerged in very cold water, to thaw it; but the frozen parts will often be quite useless.

Sorts. These are somewhat numerous, but many are coarse and deficient in flavour. Sandringham White is one of the best varieties for early work, but the red Celeries are generally considered superior, so soon as they can be obtained. Major Clarke's Solid Red and Williams' Matchless Red are two of the best for main crop, and to stand the winter. Other good varieties are Manchester Red, a strong growing and good variety to stand the winter; Sulham Prize Pink, and Leicester Red. The best white varieties, in addition to Sandringham, are Veitch's Solid White, Williams' Matchless White, and Grove White. For the Turnip-rooted Celery, *see* **Celeriac.**

CELERY FLY (*Tephritis onopordinis*). Celery Leaf-miner. Of late years, the larvæ of this destructive insect have proved a great drawback to the culture of Celery. They sometimes appear when the plants are quite small, and eat out all the inner portion of the leaves as fast as they are produced, thereby preventing the plants from growing, and causing them to turn brown and often eventually to die away. Syringing the plants with tobacco water, followed by clean water, is said to destroy them; but the best and only certain remedy is to carefully look over every plant so soon as the small larvæ are detected, pinch off the affected part of the leaves, and burn them, or destroy the insects between the finger and thumb. If this method be followed from the first, at the same time keeping the plants growing as much as possible by applying plenty of water, the insects will not be able to cause so much injury. They attack the Celery for three or four months in some seasons, and their destruction should be taken in hand immediately they are detected.

CELERY LEAF-MINER. *See* **Celery Fly.**

CELOSIA (from *kelos*, burnt; in reference to the burnt-like appearance of the flowers of some species). Cockscomb. ORD. *Amarantaceæ.* Erect, glabrous or pilose herbs. Flowers white or coloured, shining, hermaphrodite, bracteate and bracteolate, crowded in spikes or panicles; perianth five-parted; the segments equal, spreading, glabrous. Leaves alternate, petioled. We give cultural directions of *C. cristata* (Cockscomb), and under the same treatment the other varieties will thrive admirably, except that they must never be kept dry, and must be encouraged by shifting as often as necessary. It is useless to attempt growing this with any success without heat. A good specimen plant should be not more than 9in. high, and quite as wide over the top of the flower-head, which should also be as thick as possible, and of a dense colour. Seeds must be sown in March or April, in pans of well-drained, rich, sandy soil. After sowing, the pans should be placed in a hotbed, with a night temperature of 65deg., rising to about 70deg. with sun heat, and a moist, but not stagnant, atmosphere should be maintained. As soon as the seeds germinate, they should have plenty of light, and a little air; and care must be taken that the soil does not become dry. The pans must be kept near the glass. When the plants are large enough to handle, they should be potted off into small 60-sized pots, the cotyledons or seed leaves being kept close to the soil. The pots must be placed in a position close to the glass, in a frame where the same conditions are maintained as above mentioned, allowing a rise of 5deg. or 6deg. in the daytime. They should be grown as quickly as possible, and be kept rather dry, to induce flowering. As soon as the heads show, so that the best-formed ones can be selected, they should be shifted into 5in. pots, giving a good soaking before repotting. They must again be placed close to the glass, and the pots plunged to their rims in ashes or cocoa-nut fibre refuse, on a hotbed. Water must be sparingly administered, and more air admitted. If

Celosia—*continued.*

large heads are required, another shift may be given before they are too large, and 7in. pots should be used for this final potting. When these are filled with roots, liquid manure may be given about twice weekly. Moderately firm potting is necessary. The best soil to grow Celosias in is half-rich sandy loam, and half-rotten cow and stable manure mixed, with a good dash of silver sand. There are several excellent sorts, among which may be named Tom Thumb and Sutton's Prize Dwarf.

The other species differ from *C. cristata* in having large plumes of inflorescence, which form pyramidal masses of colour. Many sorts have a graceful pendent habit, which renders them objects of great beauty, when well grown. This is easily accomplished if treated in the same way as recommended for the Cockscombs. Frequent syringings are needed to keep down thrips and red spider.

FIG. 392. CELOSIA ARGENTEA, showing Entire Plant and Detached Inflorescence.

C. argentea (silvery).* *fl.* white; inflorescence dense, spicate. *l.* narrow, very shortly stalked or sessile. Tropical Asia. See Fig. 392.

C. a. linearis (linear) only differs from the typical *C. argentea* in its narrower linear leaves. India, &c.

C. cernua (drooping). A synonym of *C. cristata comosa.*

FIG. 393. FLOWER OF CELOSIA CRISTATA.

Celosia—*continued.*

C. cristata (crested).* Common Cockscomb. *fl.* dark red; spike oblong, compressed; common peduncle striated. *l.* ovate, acuminate; stipules falcate. Asia, 1570. See Fig. 393.

C. c. coccinea (scarlet) differs from the common Cockscomb in the crowded pyramidal arrangement of the inflorescence, narrower leaves, and short stamens. It will grow well in a lower temperature than required for the type. (B. R. 1834.)

C. c. comosa (hairy). *fl.* scarlet or purplish; spikes arranged in a pyramidal drooping panicle. *l.* stalked, ovate. *h.* 1ft. to 2ft. India, &c., 1810. SYN. *C. cernua.* (A. B. R. 10, 635.)

FIG 394. CELOSIA CRISTATA VARIEGATA.

C. c. variegata (variegated) differs from *C. cristata* (the wild type, from which the Garden Cockscomb has been developed) only in its variegated leaves. See Fig. 394.

FIG. 395. CELOSIA HUTTONII.

C. Huttonii (Hutton's).* *fl.* red, in ovate spikes. *l.* crimson or claret-coloured. *h.* 1ft. to 2ft. Java, 1871. A very fine-foliaged stove plant, of bushy, pyramidal habit. See Fig. 395.

C. pyramidalis (pyramidal).* *fl.*, colours various; and instead of

Celosia—*continued.*

forming a crested mass, as in *C. cristata*, they assume a more normal form in elegant plants. *h.* 1½ft. India, 1820. There are a great number of varieties of this species, all of which are very ornamental, and, in a small state, are suitable for table decoration.

CELSIA (named after Olaus Celsius, 1670-1756, professor in the university of Upsal, author of "Hierobotanicon," a work on biblical botany). ORD. *Scrophularineæ.* Hardy or half-hardy herbs. Flowers disposed in loose, terminal racemes or spikes. Leaves crenate, sinuate, dentate, or pinnatifid. This genus differs from *Verbascum* merely in having four didynamous stamens. The seed may be sown in the open borders, in June, and thinned out for flowering, or raised in nursery beds and transplanted. *C. Arcturus* should be increased by cuttings, young wood striking freely in a cool house or frame.

C. Arcturus (Arcturus).* *fl.* yellow, large; filaments bearded with purple hairs. July to September. *l.*, radical ones lyrate; superior ones oblong. *h.* 4ft. Candia, 1780. Half-hardy shrubby species. This is a pretty plant for pot culture in a cool house. (B. M. 1962.)

C. betonicæfolia (Betony-leaved). *fl.* yellow, the two superior segments marked each by a purple spot. July. *l.* ovate-oblong, wrinkled, crenated. Plant hairy. *h.* 2ft. Algeria, 1824. Half-hardy biennial. (B. M. 6066.)

C. bugulifolia (bugle-leaved).* *fl.* yellowish, with curious brown markings. *l.* stalked, ovate, crenate. *h.* 1ft. South-east Europe, 1877. Hardy. SYN. *Ianthe bugulifolia.*

C. cretica (Cretan).* *fl.* yellow, marked with two rust-coloured spots at the bottom on the upper side; 1½in. in diameter; nearly sessile. June. *l.* hairy, lyrate-oblong; upper ones oblong. *h.* 4ft. to 6ft. Crete, 1752. Hardy biennial. (B. M. 964.)

C. orientalis (oriental). *fl.* yellow, shorter than the bracts. June, July. *l.* lower ones jagged; cauline ones bipinnate; segments narrow. *h.* 2ft. Levant, 1713. Hardy annual. (S. F. G. 605.)

CELTIS (name used by Pliny for the Lotus). Nettle-tree. ORD. *Urticaceæ.* A genus of rather large, hardy, deciduous trees or shrubs, with greenish fascicled or racemose flowers, small one-seeded drupaceous fruit, and strongly-nerved, simple, alternate leaves. They thrive in ordinary soil, and are very suitable for the back of a shrubbery. Increased by seeds, which should be sown as soon as ripe; by layers; and by cuttings of ripened shoots, in autumn. The stove species are not worth growing.

C. australis (Southern). *fl.* greenish, solitary. May. *l.* ovate-lanceolate, oblong-lanceolate, or acuminate, argutely serrated, unequal at the base; upper surface rough, under one downy. *h.* 30ft. to 40ft. South Europe, 1796. (W. D. B. 105.)

C. cordata (cordate). Synonymous with *C. crassifolia.*

C. crassifolia (thick-leaved).* American Hackberry. *fl.* greenish; peduncle slender, one or two-flowered. May. *l.* rather leathery, cordate, auricled, and unequal at the base, 6in. long, 3in. to 4in. broad, serrated, rough on both surfaces. *h.* 20ft. to 30ft. North America, 1812. SYN. *C. cordata.*

C. Davidiana (Rev. Father David's). *l.* elliptic, narrowed to both ends, irregularly toothed, thick, coriaceous, glabrous, deep glaucous-green above, light green beneath. China, 1864. A much-branched tree, with pendulous twigs.

C. occidentalis (Western).* North American Nettle-tree. *fl.* greenish, small. May. *l.* reticulated, ovate-acuminate, unequal at the base, serrate, rough on the upper surface, hairy on the under one. *h.* 30ft. to 50ft. Canada, 1656. (W. D. B. 147.)

C. o. pumila (dwarf). A dwarf form, seldom exceeding 8ft. in height, with more membranous (at length) glabrous leaves.

C. Tournefortii (Tournefort's). *fl.* greenish. *l.*, when adult, ovate, acute, unequal at base, crenately serrated, roughish on the upper surface; when young, subcordate at the base. *h.* 10ft. to 12ft. Armenia, 1738.

CENTAUREA (from *Kentaurion*, the name given by Dioscorides to the Centaury, *Erythræa Centaurium*, which was said to have cured a wound in the foot of the centaur Chiron, caused by the arrow of Hercules). Centaury. ORD. *Compositæ.* Pappus short and bristly, rarely none; involucre globose or oblong; bracts imbricated, scarious, fringed, toothed, or spinous; receptacle bristly; florets all tubular, the outer ones sometimes large and neuter. Of this genus, about four hundred species (annuals, biennials, and perennials) have been described; comparatively few, however, are worth growing, but these are of the easiest culture in ordinary soil. Seeds of the annual kinds may be sown in the open border, in April, and the plants subsequently thinned out to three or four in a patch, where they are to remain and flower. The biennials may be sown in March, in a slight heat, and planted out in May. The herbaceous perennials require merely ordinary care and attention, and common garden soil, wherein to thrive well. *C. ragusina* and *C. Cineraria* are very extensively cultivated, and as failures are occasionally experienced in their propagation, the following plan, practised by a successful grower, is recommended: First, make the cuttings, about the beginning of September, take off the bottom leaves, and allow only about 1in. of wood to remain. Insert them in 60-sized pots, in a compost of loam, leaf mould, and sharp sand, in equal proportions; plunge in a cold frame, and keep them close for about four weeks, by which time they will be rooted. Great care must be taken in watering. When they become pot-bound, shift into 48-sized pots, in which they may remain until bedding-out time. Seeds may also be easily procured and raised. They should be sown in August, in slight heat; and when the seedlings are large enough to handle, they should be potted off singly into small thimble pots, in which they may be kept through the winter, in a cold frame or cool house, a shift being given in the spring. Much stronger plants are thus obtained than if the seed is sown in the early part of the year.

FIG. 396. FLOWERING BRANCH OF CENTAUREA AMERICANA.

C. alpina (alpine).* *fl.-heads* yellow; involucral scales egg-shaped, obtuse. July. *l.* decurrent, spinous, downy beneath. *h.* 3ft. Southern and Eastern Europe, 1640. Hardy herbaceous.

C. americana (American). *fl.-heads* red; outer scales of involucre three times as short as their appendages; peduncles ventricose at top. August. *l.* oblong, membranous, entire. *h.* 3ft. North America, 1824. Hardy annual. See Fig. 396.

C. atropurpurea (dark purple).* *fl.-heads* dark purple; involucral scales ovate-lanceolate, serrate, ciliated. June to August. *l.* bipinnatifid; segments lanceolate. *h.* 3ft. Eastern Europe, &c., 1802. Hardy perennial.

C. aurea (golden).* *fl.-heads* golden-yellow; involucre simply spinous; spines spreading; florets equal. July to September. *l.* hairy; lower ones pinnatifid. *h.* 2ft. South Europe, 1758. Hardy perennial. (B. M. 421.)

C. babylonica (Babylonian).* *fl.-heads* yellow, small, numerously produced close to, and along the stem. July. *l.*, root ones lanceolate-ovate, stalked, with a few small teeth; stem ones narrower, lanceolate, decurrent; large, clothed with a white cottony down, which renders this species peculiarly well adapted for borders and margins of shrubberies. *h.* 6ft. to 10ft. Levant, 1710. Hardy perennial. See Fig. 397.

C. candidissima (whitest). A synonym of *C. Cineraria.*

C. Cineraria (Cineraria). *fl.* purple; involucre ciliated. July and August. *l.* downy, very white, all compound; lowest bipinnatifid; upper ones pinnate-laciniated. *h.* 3ft. Italy, &c., 1710. Half-hardy herbaceous perennial. SYN. *C. candidissima.*

C. Cyanus (dark blue).* Blue-bottle, Bluet, or Cornflower. *fl.-heads*, florets of the disk purple, small; of the ray, bright blue, few, larger, spreading; scales of the involucre greenish, with brown margins. July. *l.* linear, entire; the lower ones often toothed; cottony. *h.* 2ft. to 3ft. Britain. This is one of the showiest of blue-flowered annuals. See Fig. 398. It varies in all shades from white to deep rose.

C. dealbata (whitened).* *fl.-heads* rose-coloured. Summer. *l.* smooth above, and covered with white hairs underneath; radical ones stalked, pinnate, with obovate lobes, coarsely toothed, often auricled at the base; stem ones pinnate, with oblong-lanceolate lobes. *h.* 1ft. to 1½ft. Caucasus, 1804. Hardy herbaceous. See Fig. 399.

C. depressa (depressed). *fl.-heads* blue, with brownish-red centre. Summer. Orient, 1818. *h.* 1ft. This species resembles *C. Cyanus*,

Centaurea—*continued.*

but is a dwarfer grower, and has brighter-coloured flowers. Hardy herbaceous. (B. M. 3662.) *C. stricta* comes very near this, if indeed, anything more than a dwarf variety.

FIG. 397. CENTAUREA BABYLONICA.

C. Fenzlii (Fenzl's).* *fl.-heads* canary-yellow, large, terminal; flower-stems erect, branching from the base. *l.* large, handsome, cordate-ovate, glaucous green, radical. *h.* 4ft. Armenia, 1868. Hardy biennial. (B. M. 6392.)

C. macrocephala (large-headed).* *fl.-heads* yellow, larger than most others; scales of involucre jagged. July. *l.* oblong-lanceolate, shortly decurrent, undivided, rough, somewhat serrated, ending in a short sharp point. Stem simple, hollow, and thickened under the flower. *h.* 3ft. Caucasus, 1805. Hardy perennial. See Fig. 400. (B. M. 1248.)

C. montana (mountain).* *fl.-heads* blue, large, handsome; florets deeply cut into four or five segments. Early summer. *l.* lanceolate, entire, decurrent, cottony. Stem usually simple, sometimes

FIG. 399. CENTAUREA DEALBATA.

Centaurea—*continued.*

sparingly branched. *h.* 2ft. Europe, 1596. Hardy perennial. (B. M. 77.) There are also white-flowered (*alba*) and rose-coloured (*rosea*) varieties, both of which are well worth growing.

FIG. 398. FLOWER AND BUD OF CENTAUREA CYANUS.

C. moschata (musky). Sweet Sultan. *fl.-heads* purple; involucre roundish, smooth; scales egg-shaped. July. *l.* lyrate-toothed. *h.* 2ft. Persia, 1629. Hardy annual.

FIG. 400. CENTAUREA MACROCEPHALA.

Centaurea—*continued.*

C. pulchra (beautiful). *fl.-heads* bright purple, globose; outer scales of involucre drawn out into an ovate, pectinately ciliated, scabrous appendage; middle bristle longer, stiffer and shining. August. *l.* sessile, glabrous, pinnate; lobes linear, acute, entire or a little toothed. Stem branched, furrowed. *h.* 1ft. Cashmere, 1838. Half-hardy. (B. R. 26, 28.)

C. ragusina (Ragusan).* *fl.-heads* yellow; involucre ciliated. June, July. *l.* downy with silvery hairs, pinnatifid; segments obtuse, egg-shaped, quite entire, outer ones largest. *h.* 2ft. Candia, 1710. Half-hardy perennial. (B. M. 494.)

C. ruthenica (Russian). *fl.-heads* pale yellow; involucre scales egg-shaped, obtuse. July. *l.* pinnate, smooth; leaflets cartilaginous, sharply serrate; terminal one oblong, egg-shaped. *h.* 3ft. Orient, 1806. Hardy perennial.

C. suaveolens (sweet-scented).* Yellow Sultan. *fl.-heads* yellow, sweet-scented; involucre round, smooth. July. *l.*, lower ones broad, somewhat spathulate, toothed; upper ones lyrate at base. *h.* 1½ft. Levant, 1683. Hardy annual. (S. B. F. G. i. 51.)

C. uniflora (one-flowered). *fl.-heads* purple, roundish, terminal, nearly sessile among the upper leaves. Summer. *l.* small, white and downy; lower ones oblong-lanceolate, toothed; upper ones lanceolate, entire. *h.* 9in. to 15in. South Europe, 1824. Hardy perennial.

CENTAURY. *See* **Erythræa Centaurium.**

CENTAURY, AMERICAN. A common name for the species of the genus *Sabbatia.*

CENTOTHECA (from *kentein*, to prick, and *theke*, a receptacle; in allusion to the retrorse hairs of the upper florets). ORD. *Gramineæ.* A genus containing two or three species, distributed over tropical Africa and Asia, and the Pacific Islands. It is a somewhat near ally of *Melica.* A compost of well-drained loam and leaf soil is best. Propagated by seeds, sown in spring.

C. lappacea (bur-like). Bur. Inflorescence paniculate; spikelets in branched racemes, many-flowered, green; pedicels hispid. *l.* sessile, lanceolate, acute, glabrous, 5in. to 6in. long, about ¾in. broad. *h.* 2ft. India, Java, &c. Greenhouse.

CENTRADENIA (from *kentron*, a spur, and *aden*, a gland; referring to a spur-like gland on the anthers). SYN. *Plagiophyllum.* ORD. *Melastomaceæ.* Stove evergreens. Flowers pink or white; racemes few-flowered, axillary. Leaves opposite, unequal, ovate or lanceolate, entire, membranous, three-nerved. They thrive in a compost of one part sandy loam, and two parts rough peat. Cuttings of side shoots should be inserted in February. *C. grandifolia* makes an elegant table ornament, and cut sprays of it last in perfection a considerable time.

C. divaricata (severed). *fl.* white, few, terminal. Central America, 1881.

C. grandifolia (large-leaved).* *fl.* pink. November. *h.* 2ft. Mexico, 1856. (B. M. 5228.)

C. rosea (rosy).* *fl.* pink; racemes sub-corymbose, terminal. January. *l.* ovate-lanceolate, unequal-sided. *h.* 1ft. Mexico, 1840. (B. R. 29, 20.)

CENTRANTHUS (from *kentron*, a spur, and *anthos*, a flower; in reference to the corolla being furnished with a spur at the base). ORD. *Valerianeæ.* Ornamental herbaceous plants. Flowers red or white, unilateral along the branches of the panicle, which is corymbose. Leaves undivided or pinnate. All the species are excellent for borders, growing in common garden soil, or on walls or rockwork; and are readily increased by seeds, which, for show annuals, should be sown in March.

FIG. 401. CENTRANTHUS MACROSIPHON, showing Habit and Single Flower.

Centranthus—*continued.*

C. angustifolius (narrow-leaved). *fl.* red, ½in. long; spur one-half shorter than the tube of the corolla. May to July. *l.* linear-lanceolate, quite entire. *h.* 1ft. to 2ft. South Europe, 1759. Hardy perennial. SYN. *Valeriana angustifolia.* (S. F. G. 29.)

C. Calcitrapa (Caltrops-like). *fl.* white, tinged with red, rather panicled. May to July. *l.*, radical ones ovate, entire, or lyrate; upper ones pinnatifid. *h.* 6in. to 1ft. South Europe, 1683. Hardy annual. SYN. *Valeriana Calcitrapa.* (S. F. G. 30.)

C. macrosiphon (large-tubed).* *fl.* rosy-carmine, rather larger than those of *C. ruber.* July. *l.* glaucous. *h.* 2ft. Spain. An annual, of compact habit. See Fig. 401. (P. F. G. 67.) Of this there is a white-flowered variety.

C. ruber (red).* Red Valerian. *fl.* red; spur one-half shorter than the tube; cymes dense, forming a handsome corymbose panicle. Summer. *l.* ovate or lanceolate; upper ones unequal at the base, toothed a little. *h.* 2ft. to 3ft. Europe (Britain). Perennial. There are several forms, including a white-flowered variety, of this species.

CENTRONIA (from *kentron*, a spur, in allusion to the spurred anthers). ORD. *Melastomaceæ.* A genus of highly ornamental shrubs, from Mexico, New Granada, Guiana, and Peru. There are nine species; in all probability, that described below is the only one now in cultivation. A compost of sandy peat and leaf mould suits them well. Propagated by cuttings of half-ripened shoots, inserted in peat and sand, under a bell glass.

C. hæmantha (blood-coloured). *fl.* deep purplish-red, too much tinged with violet to thoroughly agree with specific name; in panicles, large. *l.* shortly stalked, elliptic-obovate, five-nerved, reddish-brown beneath, deep green above. *h.* 8ft. Ocaña, 1852. Greenhouse. SYN. *Calyptraria hæmantha.*

CENTROPOGON (from *kentron*, a spur, and *pogon*, a beard; in reference to the fringe which envelops the stigma). ORD. *Campanulaceæ.* Ornamental greenhouse or stove herbaceous perennials. The most popular member of this genus is a hybrid between *C. fastuosus* and *Siphocampylos betulæfolius*, and known as *C. Lucyanus.* From its flowering naturally during the dead of the winter, it is a most desirable plant; and it is more particularly this to which the cultural remarks refer. The ready way this plant admits of increase is much in its favour, as amateurs will find no difficulty in propagating it. Any young shoots, about 3in. or 4in. long, form good cuttings, and, if taken off with a heel, root with more certainty, although others rarely fail if placed in sharp sandy soil, close around the edge of the pot, and then kept close under a bell glass or propagating box, in a temperature ranging between 60deg. and 70deg. They delight in a light, loose, rich vegetable soil, such as fibry peat, or leaf mould and loam in equal proportions. Being rather moisture-loving subjects when growing freely, it is necessary to afford them a fair amount of drainage, and to add sufficient sand when potting to keep the soil open and porous. During the early spring months, a cool stove is the best situation for them, but with the advent of summer a pit or frame is the most suitable. Here they should be plunged in a bed of gently fermenting leaves, or other material answering the same purpose, and receive a slight shade for an hour or two during the hottest part of the day. So favoured, and by shutting up immediately after giving a good syringing early in the afternoon, their growth will be rapid and clean. To insure maturation by the winter, it is a good plan to withdraw the lights in the forenoon during the early parts of September, at the end of which month they should be transferred to their winter quarters in an intermediate house or cool stove, till they begin to show blossom, when any warm greenhouse or conservatory will suit them, if the temperature does not recede below 50deg. In either of these places, it is always advisable to keep them as dry at the roots as possible, without allowing them to flag; for these, like many other plants, will endure much more cold when in this state than with the soil wet, in which condition they soon look miserable, and often die outright. Old plants, cut down, shaken out, and repotted, make grand specimens; but for general decorative purposes those struck in spring

Centropogon—*continued.*

are the best, being a nice handy size. Owing to its semi-procumbent habit, it is not only good for pot culture, but likewise forms a capital basket plant for suspending, in which position it shows off its beauties to great advantage. When grown in this way, it is best to allow it to droop naturally over the sides; but in pots it requires support, which may be afforded it by using any small neat sticks, touched over with pale green paint, so as to render them as inconspicuous as possible.

C. cordifolius (heart-shaped-leaved). *fl.* rose. November. *h.* 2ft. Guatemala, 1839. Stove species. (F. d. S. 4, 362.)

FIG. 402. FLOWERS OF CENTROPOGON FASTUOSUS.

C. fastuosus (prickly).* *fl.* rose. November. *l.* broadly lanceolate, crenately serrated. *h.* 2ft. Greenhouse species. See Fig. 402.

C. Lucyanus (M. Lucy's).* *fl.* pretty rosy carmine, tubular, freely produced at the ends of short lateral spurs. Winter. *l.* oblong-lanceolate. Stove species. This most desirable garden hybrid was raised by M. Desponds, of Marseilles, in 1856. (R. H. 1868, 291.)

C. surinamensis (Surinam). *fl.* rose. November. *h.* 2ft. Surinam, 1786. Stove species. (P. M. B. 13, 149.)

CENTROSOLENIA (from *kentron*, a sharp point, and *solen*, a tube; referring to the form of the corolla). ORD. *Gesneraceæ*. This is now regarded as a mere section of the genus *Episcia*. Stove herbaceous perennials. Corolla tubular, spurred behind at base; throat widened; limb short, five-lobed, spreading; calyx five-parted, serrated; peduncles solitary, axillary, sometimes bearing many pedicels. Leaves sub-cordate, petiolate. They thrive in a soil composed of equal parts peat, leaf mould, and sand. Good drainage is essential, and scarcely any water is needed in winter. Cuttings will root in sand, in a warm frame, with a bell glass covering.

C. bractescens (bracteate). *fl.* aggregate, bracteate; corolla large, spreading wider upwards; limb white; tube tinged with yellow; calyx a little shorter than the corolla, red-purple above and white below; peduncles short, axillary, many-flowered. June. *l.* nearly equal, large, ovate-acuminate, coarsely and unequally serrated, perfoliate at base. Stem succulent. *h.* 2ft. New Grenada, 1852. (B. M. 4675.)

Centrosolenia—*continued.*

C. bullata (bullate).* *fl.* straw-colour, very freely produced. *l.* with a very rough uneven surface, of a beautiful dark olive-green, with a bronzy shade above, and of a vinous red beneath. East of Peru. SYN. *Episcia tessellata*. (I. H. 607.)

C. glabra (smooth). *fl.*, corolla very broad, tubular, 1½in. long; limb 1in. across; white, with a sulphur-coloured tube. June. *l.* opposite, unequal, the larger one oblique obovate-oblong, serrated, pilose on the ribs beneath, the smaller one lanceolate. *h.* 1ft. La Guayra, 1846. (B. M. 4552.)

C. picta (painted).* *fl.*, corolla nearly white, tubular, about 2in. long, hairy. June. *l.* nearly equal, oval or obovate, velvety painted, serrated, on long petioles. *h.* 1ft. Banks of Amazon, 1845. (B. M. 4611.)

CENTROSTEMMA. *See* **Cyrtoceras** and **Themistoclesia.**

CEPHAELIS (from *kephale*, a head; in reference to the arrangement of the flowers). ORD. *Rubiaceæ*. Stove shrubs, rarely perennial herbs, mostly natives of tropical America, a few African, and two or three from Asia and Oceania. Heads of flowers terminal or axillary, sessile or pedunculate, subtended by an involucre of from two to eight bracts, which are disposed in a cruciately opposite manner; corolla funnel-shaped. Leaves ovate, acute, petiolate; stipules free or combined. They thrive in a compost of sandy, fibry peat, leaf soil, and lumpy loam, with thorough drainage. Cuttings of firm young shoots will root in sandy soil, under a hand glass, in moist stove heat.

C. Ipecacuanha (Ipecacuanha).* *fl.* white, downy outside; heads terminal, pedunculate, erect at first, but at length becoming pendulous. January. *l.* oblong-ovate, scabrous above, and clothed with fine down beneath. Stems ascending at first, but at length becoming erect, rather downy at the apex. *h.* 6in. Brazil, 1839. Stove herbaceous. The root of this plant has long been employed for medicinal purposes. (B. M. 4063.)

C. tomentosa (downy).* *fl.* brownish; heads on long peduncles; bracts of involucre scarlet, large, broad, ovate-cordate. June. Branches, petioles, peduncles, leaves, and involucre, hairy. *h.* 4ft. Tropical America, 1882. Stove shrub. (B. M. 6696.)

Many other species are well worth growing, but are either lost to cultivation or await introduction.

CEPHALANTHERA (from *kephale*, a head, and *anthera*, an anther). ORD. *Orchideæ*. Very interesting and curious terrestrial Orchids. Calyx of three ovate, acute, converging, permanent sepals; petals ovate, erect, as long the calyx; lip scarcely spurred, saccate at the base, contracted in the middle, undivided and recurvate at the end. They thrive well in a chalky loam, and may be propagated by divisions. The following are our three native species:

C. ensifolia (sword-leaved). *fl.* pure white; sepals and petals narrower and more pointed than in *C. grandiflora*. May and June. *l.*, lower ones broadly oblong; upper ones long and narrow lanceolate. Stems 1ft. to 2ft., sub-solitary, slender. England. Closely allied to *C. grandiflora*, but with narrower leaves. (Sy. En. B. 1484.)

C. grandiflora (large-flowered).* *fl.* white, distant, sub-erect; sepals and petals ovate-oblong, obtuse; terminal lobe of lip orbicular, erect, yellow. May and June. *l.* ovate-oblong, 3in. to 6in. long; upper ones narrower. Stems tufted, 1ft. to 2ft. high. England. (Sy. En. B. 1485.)

C. rubra (red). *fl.* rose-purple, few or many; sepals and petals acuminate; lip white; terminal lobe ovate-lanceolate. June and July. *l.* lanceolate. Stem 6in. to 18in. high, slender. England. (Sy. En. B. 1483.)

CEPHALANTHUS (from *kephale*, a head, and *anthos*, a flower; the flowers are disposed in globular heads). Button-wood. ORD. *Rubiaceæ*. An ornamental hardy deciduous shrub, growing in common garden soil, but preferring moist sandy peat. The most suitable place for it is the American garden. Propagated best by layers, in the early autumn.

C. occidentalis (Western).* *fl.* whitish-yellow; peduncles much longer than the heads, usually by threes, at the tops of the branches. July. *l.* opposite, or three in a whorl, ovate or oval, acuminated. *h.* 7ft. North America, 1735. (T. S. M. 394.)

CEPHALARIA (from *kephale*, a head; the flowers being disposed in round heads). ORD. *Dipsaceæ*. A genus of hardy annual or perennial herbs, closely allied to *Dipsacus*. Flower-heads terminal, globose; involucre surrounding the heads of many imbricated leaves, shorter than the paleæ. Leaves toothed or pinnatifid. Most of the

Cephalaria—*continued.*

species are too coarse to admit of their being grown in the ordinary borders, but they are very desirable for naturalising in the wild garden, or other similar places. For culture, *see* **Dipsacus.**

C. tartarica (Tartarian). *fl.-heads* yellow, large; paleæ deep green, white inside, ciliated. Summer. *l.* pinnate; leaflets decurrent, oval-lanceolate, serrated. Stems striated, clothed with retrograde villi at the base and on the petioles. *h.* 5ft. to 6ft. Siberia, 1759. Perennial.

Several other names occur in nurserymen's catalogues, but the above-mentioned species is the best.

FIG. 403. CEPHALOTUS FOLLICULARIS, showing Flower-spike and Pitcher-like Leaves.

CEPHALOTAXUS (from *kephale*, a head, and *Taxus*, the Yew; referring to the general appearance of these trees). Cluster-flowered Yew. ORD. *Coniferæ*. A small genus of coniferous plants, with Yew-like foliage. Flowers dicœcious, in clusters. Fruit large, plum-like, two or three together. Leaves linear, two-rowed, sharply pointed. Primary branches whorled, spreading. They are hardy, and succeed in almost any soil, but do best in sheltered spots. Propagated by seeds, or by cuttings. The latter should be inserted in August or September, in sandy soil, under handlights, or in a cold frame kept shaded during bright weather.

Cephalotaxus—*continued.*

C. coriacea (coriaceous). A synonym of *C. drupacea.*

C. drupacea (drupaceous).* *l.* yellowish, glossy green above, glaucous beneath, crowded, 1in. to 2in. long, linear, arranged in two opposite rows. *fr.* purple, oval-oblong, about 1in. in length. *h.* 6ft. to 8ft. Japan, 1844. SYNS. *C. coriacea, C. fœminea, Podocarpus coriacea.*

C. filiformis (thread-like). A synonym of *C. Fortunei.*

C. fœminea (female). A synonym of *C. drupacea.*

C. Fortunei (Fortune's).* *l.* dark green above, lighter beneath, 3in. or more long, gradually narrowing to a sharp point, arranged in two rows. Branches long, slender, pendulous. *h.* 6ft. to 8ft. China, 1848. Probably the species best adapted to the English climate. SYNS. *C. filiformis, C. mascula,* and *C. pendula.* (B. M. 4449.)

C. mascula (male). A synonym of *C. Fortunei.*

C. pedunculata (peduncled).* Lord Harrington's Yew. *l.* bright green above, marked with two broad glaucous lines beneath, 1in. to 2in. long, arranged in two rows. *fr.* large, drupaceous, on long peduncles. *h.* 6ft. to 8ft. Japan, 1837. SYNS. *Taxus Harringtoniana, T. sinensis.* (G. C. n. s., xxi. 113.) The variety *fastigiata* (= *Taxus Fortunei, T. japonica*) and *Podocarpus koraiana* is very distinct and ornamental, having bunches as erect as the trunk, and the leaves scattered or spirally arranged around them. *C. p. sphæralis* differs principally in the globular, berry-like fruits. (G. C. n. s., xxi. 117.)

C. pendula (pendulous). A synonym of *C. Fortunei.*

CEPHALOTUS (from *kephalotes*, headed; in reference to the filaments of the stamens being capitate). ORD. *Saxifrageæ.* A very curious cool greenhouse herbaceous perennial, thriving well in a mixture of chopped living sphagnum and sandy, rough peat, well drained. It is very important to ensure porous material for its growth, admitting a free circulation of water. A humid atmosphere in summer is essential; and to secure this, it is best to place a bell glass over the pan in which the plant is grown. In winter, less moisture, both at the roots and in the atmosphere, is needed. Propagated by division, before new growth commences; or by seeds.

C. follicularis (follicled).* New Holland Pitcher-plant. *fl.* white, small, on an erect scape. *l.* all radical and stalked; some are elliptical and flat, and others dilated into pitchers similar to the ascidia of the genus *Nepenthes.* These pitchers vary from 1in. to 3in. in length, and are dark green, tinged with purple; lid netted with veins of reddish-pink. Plant almost stemless. *h.* 2in. to 3in. West Australia, 1822. See Fig. 403.

CERACEOUS. Wax-like.

CERANTHERA. A small genus of African shrubs or trees, now united to *Alsodeia.*

CERASTIUM (from *keras*, a horn; many of the species have capsules exactly the form of an ox's horn). Mouse-ear Chickweed. ORD. *Caryophylleæ.* Decumbent hairy hardy annual or perennial herbaceous plants. Flowers white, small. The two species most generally cultivated are *Biebersteinii* and *tomentosum.* These are grown principally on account of their silvery foliage. All are of very easy culture in ordinary garden soil, or on the rockery. They are readily propagated by divisions; or by cuttings, inserted in the open ground, and in a shady place, after flowering. The species enumerated below are all perennials.

C. alpinum (alpine).* *fl.* white; panicles rather hairy, few-flowered. June, July. *l.* ovate, elliptical, or oblong, covered with long silky hairs, or nearly smooth. *h.* 2in. to 4in. Britain. (Sy. En. B. 223.)

C. Biebersteinii (Bieberstein's).* *fl.* white; stalks erect, dichotomous. Early summer. *l.* woolly, ovate-lanceolate. Stems branching. *h.* 6in. Tauria, 1820. Evergreen. Closely allied to *C. tomentosum,* but with larger leaves and flowers. (B. M. 2782.)

C. Boissieri (Boissier's).* *fl.* white, large; cymes regular, dichotomous. Summer. *l.* sessile, silvery, usually ovate-lanceolate, acute, entire. *h.* 4in. to 1ft. Spain.

C. grandiflorum (large-flowered). *fl.* white, large, conspicuous; peduncles seven to fifteen-flowered, erect; profusely produced. Summer. *l.* narrow, acute, hoary or woolly; margins somewhat revolute. *h.* 6in. Eastern Europe. A strong-growing deciduous species, and consequently should only be cultivated where plenty of room can be allowed it.

C. latifolium (broad-leaved). *fl.* white, solitary, or the peduncle sparingly forked, larger than most of the other species. July. *l.* ovate, slightly stalked, pale green, or slightly glaucous. *h.* 3in to 6in. North Europe (Britain). Deciduous. (Sy. En. B. 224.)

Cerastium—*continued.*

C. tomentosum (downy).* *fl.* white; cymes forked, on erect stalks. Early summer. *l.* oblong-spathulate, upper ones lanceolate, densely clothed with a greyish tomentum. *h.* 6in. Southern and Eastern Europe, 1648. This evergreen species is largely employed in almost all gardens for edgings to summer flower-beds, &c. (S. F. G. 455.)

CERASUS (said to have been first brought from Cerasus, a town in Pontus, in Asia). Cherry. ORD. *Rosaceæ.* Hardy deciduous or evergreen shrubs and trees.

FIG. 403A. FLOWERING BRANCH OF CERASUS ILICIFOLIA.

Flowers white; pedicels one-flowered, rising before the leaves in fascicled umbels from scaly buds, but sometimes rising after the evolution of the leaves in racemes from the tops of the branches. Drupe globose or umbilicate at the base, fleshy, quite glabrous, destitute of bloom, containing a smooth, rather globose, compressed stone. Leaves, when young, conduplicate. By far the larger number of the species are deciduous, but two very important ones are evergreen, viz., the common Laurel (*C. Laurocerasus*), with its numerous varieties, and the Portugal Laurel (*C. lusitanica*). The various species and varieties are propagated by seeds, cuttings, grafting, or budding. The seeds should be sown in autumn, in beds, or they may be kept till spring. Cuttings should be bedded in a semi-shady position, in autumn, or not later

Cerasus—*continued.*

than February, some sharp sand being added to the soil. For culture, &c., of the edible-fruited kinds, *see* **Cherry.**

C. Avium (birds'). Wild Cherry, or Gean. *fl.* rising with the leaves; bud oblong, acute, destitute of leafy scales. April and May. *fr.* roundish-ovate, depressed, black; flesh adhering to the stone, very succulent and sugary, the juice usually coloured. *l.* oval-lanceolate, pointed, serrated, somewhat pendent, slightly pubescent on the under side, and furnished with two glands at the base. *h.* 20ft. to 40ft. England. Deciduous.

C. A. multiplex (double-flowered).* *fl.* smaller than the type, ovate, bearing two or three glands at the base.

C. Caproniana.* Common Cherry. *fl.* rising with the leaves; calyx large, campanulate; peduncles usually thick, stiffish, not long. Spring. *fr.* globose, depressed, with the suture hardly depressed; flesh soft, more or less acid and styptic. *l.* oval-lanceolate, toothed, glabrous. *h.* 15ft. to 20ft. Europe. Small tree, with spreading branches. Of this deciduous species, innumerable varieties have been raised. The most important of the fruit-bearing sorts will be found described under **Cherry.** The double-flowered variety (*multiplex*) is very showy, and useful for forcing and for shrubberies (SYN. *C. ranunculiflora*). (F. d. S. 1805.)

C. caroliniana (Carolina).* *fl.* rather large; racemes axillary, dense, shorter than the leaves. May. *fr.* nearly globose, mucronate. *l.* evergreen, on short petioles, oblong-lanceolate, mucronate, smooth, rather coriaceous, almost entire. North America, 1759.

C. Chamæcerasus. Ground Cherry. *fl.* umbellate; umbels usually sessile; peduncles longer than the leaves when in fruit. May. *fr.* round, reddish-purple, very acid. *l.* obovate, shining, crenated, bluntish, quite glabrous, rather coriaceous, hardly glandular. *h.* 2ft. to 4ft. Europe, 1597. Deciduous. There is a creeping form, *pendula*, and another with variegated leaves.

C. depressa (depressed). *fl.* white; umbels few-flowered, sessile-aggregate. May. *fr.* ovate. *l.* lanceolate-cuneated, a little serrated, glabrous, glaucous beneath. Branches angular, depressed, prostrate. North America, 1805. Deciduous. The correct name of this plant is *Prunus pumila.*

C. duracina (hard).* *fl.* white, rising with the leaves; peduncles long, slender. April. *fr.* heart-shaped; suture much depressed, rarely almost obsolete; flesh hard and brittle. Branches ascending when young, but in the adult state hardly spreading. *h.* 10ft. to 20ft. A large, deciduous tree. SYN. *Prunus Cerasus Bigarella.* It is probable that this species, crossed with *C. Avium*, has produced the Bigarreau and Heart Cherries.

C. ilicifolia (Holly-leaved). *fl.* white, small, in racemes ½in. to 2in. long. March to May. *fr.* large, ½in. or more thick, usually red, sometimes dark purple or black. California. An ornamental shrub, with shining dark evergreen foliage; excellent for corridor or conservatory. In the open air, it requires a wall, and extra shelter during winter. See Fig. 403A. SYN. *Prunus ilicifolia.*

C. Juliana (St. Julian's). *fl.* rising with the leaves. *fr.* ovate, depressed, heart-shaped; flesh sweet, rather soft. Branches ascending when young, but when in an adult state hardly spreading. *h.* 20ft. to 40ft. South Europe. The varieties of this deciduous species—frequently, and probably correctly, classed as forms of *C. Avium*—are known as Guigniers, or Heaumiers.

FIG. 404. BRANCHLET OF CERASUS LAUROCERASUS.

C. Laurocerasus.* Common Laurel. *fl.* white; racemes shorter than the leaves. April and May. *fr.* ovate, acute. *l.* ovate-lanceolate, remotely-serrated, furnished with two or four glands beneath. *h.* 6ft. to 10ft. Levant, 1629. Evergreen shrub. See Fig. 404. The following varieties are found in gardens, and are all useful for extensive planting in shrubberies or woodlands: *angustifolia* (narrow-leaved); *camelliæfolia* (Camellia-leaved); *caucasica* (Caucasian); *colchica* (Colchican), very useful; *rotundifolia* (round-leaved), and *variegata* (variegated-leaved).

Cerasus—*continued.*

C. lusitanica (Portuguese).* Portugal Laurel. *fl.* white; racemes erect, axillary, longer than the leaves. June. *fr.* ovate, red when ripe. *l.* evergreen, ovate-lanceolate, serrated, glandless. *h.* 10ft. to 20ft. Portugal, 1648. This is one of the most excellent shrubs grown. There is a variety named *myrtifolia* (Myrtle-leaved) which produces smaller leaves, and is of compact growth. It is frequently called the Upright Portugal Laurel.

C. Mahaleb (Mahaleb). *fl.* white; racemes somewhat corymbose, leafy. April and May. *fr.* ovate-roundish, black, yielding a bitter purple juice, the stain of which is not easily effaced. *l.* broad, roundish-cordate, denticulated, glandular, folded together,

Cerasus—*continued.*

bracteosa (long-bracted), *heterophylla* (various-leaved), *parviflora* (small-flowered), and *rubra* (red).

C. pendula (drooping). A synonym of *Prunus subhirtella.*

C. pseudo-cerasus.* Bastard Cherry. *fl.* white, racemose. April and May. Branches and peduncles pubescent. *fr.* pale red, small, of a pleasant sub-acid flavour, with a very small stone. *l.* obovate, acuminated, flat, serrated. Branches and peduncles pubescent. *h.* 6ft. to 10ft. China, 1819. This deciduous species bears forcing well. SYN. *Prunus paniculata.* (B. R. 800.)

C. ranunculiflora (Ranunculus-flowered). A synonym of *C. Caproniana multiplex.*

FIG. 405. FLOWERING BRANCH OF DOUBLE WHITE CHINESE CHERRY (CERASUS SERRULATA).

h. 10ft. South Europe, 1714. The wood is red, very hard, and sweet-scented. Deciduous.

C. occidentalis (Western).* *fl.* white; racemes lateral. *l.* evergreen, glandless, oblong, acuminated, quite entire, glabrous on both surfaces. *h.* 20ft. West Indies, 1784. Stove evergreen tree.

C. Padus. Common Padus, Bird Cherry, or Hagberry. *fl.* white; racemes terminal, elongated, leafy, drooping. April and May. *fr.* round, black, nauseous to most palates, but, infused in gin or whiskey, it greatly improves these spirits. *l.* ovate-lanceolate, rather acuminated. *h.* 10ft. to 30ft. Britain. There are numerous forms of this deciduous species, including the following: *argentea* (silver-blotched-leaved), *aucubæfolia* (Aucuba-leaved),

C. salicina (Willow-leaved). *fl.* white, small, usually solitary, shorter than the leaves. April. *fr.* about the size of that of the Myrobalan Plum. *l.* obovate, acuminated, glandularly serrated, glabrous; stipules subulate, glandular, length of the petiole. *h.* 4ft. to 6ft. China, 1822. Half-hardy deciduous.

C. semperflorens (ever-flowering). All Saints', Ever-flowering, or Weeping Cherry. *fl.* white, axillary, solitary. May. *fr.* red, small, round, watery, of but little value. *l.* ovate, serrated. Branches drooping. *h.* 10ft. to 20ft. 1822. (W. D. B. 131.) The variety *aurea variegata* (golden-variegated) is very handsome.

C. serotina (late). *fl.* white, in racemes terminating leafy branches. *fr.* purplish-black. *l.* lanceolate-oblong, acuminate,

Cerasus—*continued.*

serrated, with incurved, short, or callous teeth. Eastern United States. A large deciduous tree, furnishing valuable timber. (W. D. B. 48.)

C. serrulata (saw-leaved).* Double Chinese Cherry. *fl.* pale white or rose-tinted, double, disposed in fascicles. April. *l.* obovate, acuminated, setaceously serrulated, quite glabrous; petioles glandular. *h.* 15ft. China, 1822. SYN. *C. Sieboldii.* Deciduous. See Fig. 405. (R. H. 1866, 371.)

C. Sieboldii (Siebold's). Synonymous with *C. serrulata.*

C. sphærocarpa (round-fruited). *fl.* white; racemes axillary, erect, small, shorter than the leaves. June and July. *fr.* nearly globose, purple when ripe. *l.* glandless, shining, about 2in. long and 1½in. broad. *h.* 10ft. to 12ft. Jamaica, 1820. Stove evergreen.

C. virginiana (Virginian). Choke-Cherry. *fl.* white; racemes erect, elongated. May and June. *fr.* globose, red. *l.* oblong, acuminated, doubly-toothed, smooth; petioles usually bearing about four glands. Wood beautifully veined with black and white. *h.* 20ft. to 80ft. Eastern United States, 1724. Deciduous.

CERATIOLA (from *keration*, a diminutive of *keras*, a horn; in reference to the stigma radiating into four divisions like little horns, as in the Carnation). ORD. *Empetraceæ.* An upright, much-branched, evergreen, half-hardy shrub, much resembling an Erica. When well grown, it is a very handsome little plant. It thrives well in sandy peat, to which may be added a little very fibry loam. It will probably prove quite hardy in the West of England; but if grown out of doors in other parts of the country, it should have protection during winter. Propagated by cuttings, which should be placed in sandy soil, under a bell glass.

C. ericoides (Heath-like).* *fl.* brownish, sessile, in the axils of the upper leaves, rarely solitary, sometimes verticillate. June. *l.* simple, alternate, exstipulate, spreading, needle-shaped, obtuse, glabrous and shining, about ¼in. long, sometimes crowded as if verticillate. Berries globose, yellow. Florida, Carolina, 1826. (B. M. 2753.)

CERATODACTYLIS. *See* **Llavea.**

CERATOLOBUS (from *keras*, a horn, and *lobos*, a pod; referring to the horned pod-like spathe). ORD. *Palmæ.* Slender-growing stove Palms, of great beauty, and requiring culture similar to **Calamus** (which *see*).

C. concolor (one-coloured). *l.*, sheath sub-strigose; segments green beneath. *fr.* sub-globose. Sumatra.

C. glaucescens (milky-green-leaved).* *l.* pinnate, 1ft. to 2ft. long; pinnæ somewhat cuneate, lengthened out into a tail-like point; edges erose, dark green on the upper surface, grey below; petioles sheathing, densely armed with slender spines. Java. This makes an elegant table plant.

CERATONIA (from *keration*, a horn or pod; in allusion to the shape of the pods). Algaroba Bean, or Carob. This plant is called by Theophrastus, *Keronia*; by Dioscorides, *Kerateia.* ORD. *Leguminosæ.* An evergreen tree, with a thick trunk, and abruptly-pinnate, coriaceous, shining leaves. It thrives well in the South of England, in any ordinary garden soil, if afforded the protection of a wall, and slightly sheltered during winter. Ripened cuttings will root if planted in sand, with a hand glass placed over them.

C. Siliqua (podded). Bean-tree, Carob-tree, or Locust-tree. *fl.* red, small, racemose. September. *l.*, leaflets oval, obtuse, flat, coriaceous, shining, dark green. Plant unarmed. *h.* 30ft. to 50ft. South Europe, 1570. This tree is much cultivated in the South of Europe for the sake of the pods, the pulp of which is eaten; these are 4in. or more in length, and are, as well as the seeds, of a dusky ferruginous colour. (A. B. R. 567.)

CERATOPETALUM (from *keras*, a horn, and *petalon*, a petal; the petals are jagged so as to resemble a stag's horn). ORD. *Saxifrageæ.* A genus containing a couple of species of greenhouse trees, limited to New South Wales. Flowers small, in terminal trichotomous cymes or corymbose panicles. They have opposite leaves, with one to three digitate leaflets, articulate on the petiole; stipules very small, caducous. For culture, *see* **Callicoma.**

C. apetalum (without petals). *fl.* greenish-yellow. *l.*, leaflets usually solitary (occasionally three on luxuriant shoots or young trees). *h.* 50ft. to 60ft.

C. gummiferum (gum-bearing). *fl.* yellow, in terminal panicles. June. *l.* ternate; leaflets three, lanceolate, serrated, coriaceous, and smooth. *h.* 30ft. to 40ft. 1823.

CERATOPTERIS (from *keras*, a horn, and *pteris*, a fern). ORD. *Filices.* A very curious stove aquatic annual monotypic genus. Sori placed on two or three veins, which run down the frond longitudinally, and are nearly parallel with both the edge and midrib. Capsules scattered on the receptacles, sessile, globose, with a ring which is either complete, or more or less partial or obsolete. Involucre formed of the reflexed margin of the frond, those of the two sides meeting against the midrib. When nicely grown in water, this is a very handsome plant, and not inaptly called the Floating Stag's-horn Fern. The spores must be preserved and sown early in spring, in a pot of very moist loam; they germinate rapidly if plunged in water, in February. Young plants may also be obtained from the proliferous buds, by pegging the sterile fronds on to a surface of moist earth. It succeeds best when the pot containing it is plunged to the rim in water.

C. thalictroides (Thalictrum-like).* *sti.* tufted, thick, inflated. *fronds* succulent, the barren ones floating, simple or slightly divided when young, bi- or tripinnate, with narrow linear segments, when mature; fertile ones bi- or tripinnate; ultimate segments pod-like. Tropics, in quiet waters. SYN. *Parkeria pteroides.*

CERATOSTEMA (from *keras*, a horn, and *stemon*, a stamen; in reference to the anthers being bluntly spurred at the base). ORD. *Vacciniaceæ.* Very pretty greenhouse evergreen shrubs. Flowers almost sessile, lateral and terminal, pedunculate; corollas large, scarlet. Leaves oblong, on short petioles, almost veinless, coriaceous, rounded, and sub-cordate at the base. They require a compost of sandy loam and peat; and are readily increased by cuttings, planted in sand, and placed under a glass.

C. longiflorum (long-flowered). *fl.* crimson. Andes of Peru, elevation 12,000ft. above sea-level, 1846. (B. M. 4779.)

C. speciosum (showy).* *fl.* bright orange-red, about 1¾in. long; spikes short, axillary, secund, drooping. *l.* coriaceous, ovate-lanceolate, with a short twisted petiole. Ecuador, 1870.

CERATOZAMIA (from *keras*, a horn, and *Zamia*, another genus of *Cycadaceæ*, which this much resembles; in reference to the horned scales of the cones). ORD. *Cycadaceæ.* Stove plants, distinguished from *Zamia* in having the thickened apices of the scales of the male and female cones bicornute (*i.e.*, two-horned), instead of hornless. Leaflets articulated. Trunks short. They require a moist atmosphere, and a compost of rich light loam and rotten leaves. Propagated by seeds, and sometimes by suckers and divisions; but imported plants give most satisfaction.

C. fusco-viridis (dusky-green).* *l.* 3ft. to 4ft. long, broadly pinnate, of a fine arching habit; pinnæ deep green, 6in. to 7in. long, sessile, lanceolate, and tapering to a longish point. Trunk furnished with broadish scales, surrounding each of the leafstalks, which are nearly terete above and asperous along the edges. Young leaves of a rich bronzy-chocolate colour, but gradually changing to olive-green and, finally, deep green. Mexico, 1879.

C. Kusteriana (Kuster's). *l.* 2ft. to 4ft. long, pinnate, spreading; pinnæ semi-lunate, tapering to a sharp point, coriaceous, 6in. to 10in. long, about ½in. broad, dark green. Mexico.

C. mexicana (Mexican).* *Male: l.* pinnate, about 6ft. long; pinnæ coriaceous, sessile, cordate-lanceolate, tapering to a sharp point, 9in. to 12in. long, 1½in. broad, dark green; petioles spiny for about half their length, very stout at the base. Mexico. *Female: l.* pinnate, 3ft. to 4ft. long, pendulous; pinnæ 6in. to 10in. long, tapering to a point, rich dark green on both surfaces; naked portion of petiole armed with short white spines. Stem stout. Mexico.

C. Miqueliana (Miquel's).* *l.* pinnate, spreading; pinnæ coriaceous, oblong, abruptly tapering to a point, 6in. to 12in. long, 2in. broad, dark green. Stem slender. Mexico.

CERBERA (so named from Cerberus, of mythological note, on account of its poisonous qualities). ORD. *Apocynaceæ.* Stove evergreen shrubs or trees. Peduncles extra-axillary at the tops of the branches; corolla funnel-shaped; tube pilose inside at top. Leaves scattered, quite entire. They require a rich fibry loam, and cuttings of young, rather ripe shoots will root in sand, if planted in April, in bottom heat.

C. Manghas (Manghas). *fl.* white, with a pink centre; petals ovate, with an incurved, sub-retuse apex; panicle terminal, corymbose, large, open. July to September. *l.* oblong-lanceolate, acute, tapering downwards, approximate, shiny. *h.* 20ft. Stove tree. (B. M. 1845.)

CERCIS (from *kerkis*, a shuttlecock; a name given by Theophrastus to this tree). Judas-tree. ORD. *Leguminosæ*. Ornamental, hardy, deciduous trees. For their singular beauty, they deserve a place in every garden and shrubbery. When the trees have arrived at a good size, the branches are so thickly beset with flowers as scarcely to be seen;

FIG. 406. FLOWERING BRANCH OF CERCIS SILIQUASTRUM.

and the singular shape of the leaves—which appear after the flowers—makes a very agreeable variety in summer. The trees prefer a deep, free, rich, sandy soil. They are generally raised from seeds, which should be sown about

FIG. 407. CEREUS GRANDIFLORUS.

Cercis—*continued.*

the end of March, on a bed of light soil, in a gentle heat. The young plants will produce flowers in three or four years; they may also be propagated by layers, but plants raised from seeds thrive best.

C. canadensis (Canadian).* *fl.* red; pedicels one-flowered, rising from the trunk and branches in fascicles. May. *l.* cordate, acuminate, villous in the axils of the veins beneath. *h.* 12ft. to 20ft. Canada, 1730.

C. chinensis (Chinese).* This recently-introduced species closely resembles *C. canadensis* in foliage; the pink flowers are larger. SYN. *C. japonica.*

C. japonica (Japanese). A synonym of *C. chinensis.*

C. Siliquastrum.* Common Judas-tree; Love-tree. *fl.* bright purple; pedicels one-flowered, rising from the trunk and branches in fascicles. May. *l.* simple, cordate, very blunt, emarginate, quite glabrous. *h.* 20ft. to 30ft. South Europe, 1596. In northern parts of this country, this fine species requires to be planted against a wall, in which situation it thrives admirably. The wood is very beautiful and veined with black, takes an excellent polish, and may be utilised for many purposes. See Fig. 406. (B. M. 1138.) There are varieties with flesh-coloured and white flowers.

CERCOCARPUS (from *kerkis*, a shuttle, and *karpos*, a fruit; in reference to the shape of the fruit). ORD. *Rosaceæ*. Greenhouse or half-hardy evergreen shrubs or small trees. They thrive in a mixture of peat and loam. Cuttings will root if planted in a pot of sand, with a hand glass placed over them.

C. fothergilloides (Fothergilla-like).* *fl.* in axillary umbellate fascicles; calyx purple, with a cylindrical permanent tube. May. *l.* alternate, entire, nearly elliptic, coriaceous, glabrous, furnished with two petiolar stipules. *h.* 12ft. Mexico, 1828.

FIG. 408. CEREUS NYCTICALUS.

CEREUS (from *cereus*, pliant; in reference to the shoots of some species). Torch Thistle. ORD. *Cacteæ*. Fleshy grotesque greenhouse shrubs, with a woody axis, and medulliferous inside; angles vertical, bearing fascicles of spines, regularly furrowed. Flowers large, rising from

Cereus—*continued.*

the fascicles of spines, or indentures on the angles; sepals very numerous, imbricated, adnate to the base of the ovary, united into an elongated tube; outer sepals the shortest, forming the calyx; middle ones longer and coloured, innermost ones petaloid; stamens very numerous, united with the tube; style filiform, multifid at the apex. Berry areolate, tubercular or scaly, either from the remains of the sepals, or from their cicatrices when they have fallen off. For culture, *see* **Cactus.**

Of this large genus, the following species are the best, and most easily obtained. Numerous others are offered for sale, principally by continental growers.

C. coccineus (scarlet).* *fl.* scarlet, large, numerous. September. Plant with long joints, rooting, deep green, triangular; ribs compressed, repand; prickles rising from yellow tomentum, radiating ones few, pilose, white, and four rather recurved, stiff, fulvous central ones in each fascicle. Brazil, 1828.

C. crenulatus (crenulate). Plant simple, erect, greyish-green; with eight blunt tubercular ribs, and narrow recesses; areolæ, while young, convex and velvety; prickles fourteen in each fascicle, white, setaceous, stiff, outer ten radiating, central four diverging, and longer than the others. Stem 6in. high, and 2in. in diameter. Mexico, 1822.

FIG. 409. CEREUS PLEIOGONUS.

C. fimbriatus (fringed).* *fl.* rose-coloured, campanulate, with few petals, which are fringed; tube short; stamens very numerous. *fr.* globose, red, size of an orange, beset with prickly tubercles. Plant tall, erect, bluntly eight-angled; prickles setaceous, white. *h.* 18ft. to 25ft. St. Domingo, 1826.

C. flagelliformis (whip-formed).* *fl.* red or pink, very handsome; style rather shorter than the petals. March. Stems prostrate, creeping, with about ten angles; tubercles crowded, bearing bristles. Peru, 1690. (B. M. 17.)

C. fulgidus (glittering).* *fl.* orange-scarlet, having the inner petals blood-red, and glossy with a metallic lustre, 6in. to 7in. across.

Cereus—*continued.*

Tropical America, 1870. A very handsome tall-growing plant, with three to four-angled stems, spiny at the nodes. (B. M. 5856.)

C. grandiflorus (large-flowered).* *fl.* very large. June to August. Stems rooting, diffuse, climbing, five to six-angled; bristles 5in. to 8in. each, fascicled, hardly longer than the down from which they proceed. West Indian Islands, 1700. The flowers continue about six hours in full blossom. They begin to open between seven and eight o'clock in the evening, and are fully blown by eleven. By three or four o'clock in the morning, they fade; but, during their short existence, there is hardly any flower of greater beauty, or that makes a more magnificent appearance. The calyx of the flower, when open, is nearly 1ft. in diameter; the inside, being of a splendid yellow colour, appears like the rays of a bright star; the outside is of a dark brown. The petals, being of a pure white, contribute to the lustre; the vast number of recurved stamens in the centre of the flower make a fine appearance. Add to all this the strong, sweet fragrance, and there is scarcely any plant which so much deserves a place in the stove, as this, especially as it may be trained against the wall, where it will not take up any room. See Fig. 407. (B. M. 3381.)

FIG. 410. CEREUS SERPENTINUS.

C. hexagonus (six-angled). *fl.* solitary, 6in. long; the sepals along the tube greenish and irregularly imbricated; limb a little expanded, reddish outside and white inside; stamens greenish. Plant simple, erect, large, usually with six strong ribs; fascicles of spines middle-sized; prickles short, brown. *h.* about 40ft., usually without any branches. South America, 1690.

C. lividus (livid). *fl.* white, with a yellow-green tinge towards the outside, 10in. in diameter. June. Plant erect, very sparingly branched; stems five to six-angled, constricted or jointed at intervals, with thick, flat, straight, round-edged ribs, 1in. or more in depth. Brazil, 1868.

C. Macdonaldiæ (Macdonald's).* *fl.* opening during the night, when fully expanded 12in. to 14in. diameter; sepals bright red and orange, radiating, and very numerous; petals delicate white. July. Stems cylindrical, creeping, branched, slender. Honduras. This is a magnificent species. (B. M. 4707.)

Cereus—*continued.*

C. nycticalus (night-flowering). *fl.* white, opening at night, scentless, similar in form to, but larger than, those of *C. grandiflorus*. Plant with sub-erect, long, jointed, climbing branches, some cylindrical with four to five series of spines, others with from four to six ribs. Spines small, very rigid, each cluster containing about four, mixed with white, often deciduous setæ. Mexico. Suitable for planting against the wall of a warm greenhouse. See Fig. 408.

C. pentagonus (five-angled).* *fl.* white, large. July. Plant erect, jointed, slender, pale green, five-angled; ribs repand; prickles naked at the base, nearly equal, slender, straw-coloured, with five to six radiating ones in each fascicle, and one central one. Stems varying, with three, four, or five angles. *h.* 3ft. South America, 1769.

C. pleiogonus (many-stamened). *fl.* purplish-red. Plant light olive-green, erect, cylindrical, with about thirteen very small ribs; the areolæ are slightly swollen at the summit, then form small tubercles more and more distinct until, at the base, the ribs almost completely disappear. Spines about thirteen, the exterior ones radiating pretty regularly; the upper ones the shorter, and the interior ones more or less erect. Native country unknown. *h.* 6in. See Fig. 409.

C. quadrangularis (four-angled).* *fl.* white, opening at night, beautiful and sweet-scented. Plant creeping, three to four-angled; angles hardly channelled; spines five to seven in each fascicle, hardly stellate. West Indies, 1809.

C. repandus (repand). *fl.*, tube green, unarmed; inner calycine or corolline lobes white; outer lobes of calyx narrow and much acuminated, almost exceeding the inner ones in length. May. Plant long, erect, with eight to nine blunt angles; angles rather undulated; spines longer than the wool from which they issue. *h.* 10ft. to 20ft. Caribbee Islands, 1728. (B. R. 336.)

C. serpentinus (serpentine).* *fl.* large, very handsome; lobes bluntish, outer ones greenish, middle ones purplish, inner ones white; floral tubes very bristly at the base. Plant creeping, flexuous, and somewhat climbing, with eleven to twelve very blunt angles; bristles in fascicles, much longer than the wool from which they issue, but which at length falls off. *h.* 3ft. to 4ft. South America, 1817. See Fig. 410. (B. M. 3566.)

C. speciosissimus (most showy).* *fl.* large, of a beautiful scarlet colour, sometimes violaceous inside; petals spreading; stamens white. July, August. Plant erect, three to four-angled; angles toothed; prickles subulate, straight, rising from white tomentum. *h.* 3ft. to 6ft. Mexico, 1816. (B. M. 3822.)

C. triangularis (three-angled). *fl.* greenish on the outside, and white inside, larger than that of most other species. July. Plant creeping, trigonal; prickles short, four in a fascicle, somewhat decussate. *h.* 1ft. to 2ft. Mexico, 1690. (B. M. 1884.)

CERIFEROUS. Bearing or producing wax.

CERINTHE (from *keros*, wax, and *anthos*, a flower; bees are supposed to obtain wax largely from the flowers). Honeywort. Ord. *Borragineæ*. Glabrous, glaucous, hardy annuals or perennials, with terminal leafy racemes of tubularly campanulate, drooping, variegated flowers. All are of easy culture in common garden soil. Seeds should be sown in spring, in sunny spots. *C. maculata*, being a perennial, requires to be planted in a sheltered, dry situation, or the fleshy roots will be apt to rot.

C. aspera (rough). *fl.*, corolla yellow, with a brownish-purple tube, cylindrical, five-toothed, twice as long as the calyx. July. *l.* oblong, denticulately ciliated, rough beneath. *h.* 1ft. to 2ft. South Europe, 1633. Annual. (S. F. G. 170.)

C. glabra (glabrous). *fl.*, corolla yellow at bottom and violaceous at top, five-toothed. June. *l.* ovate-lanceolate, quite entire. *h.* 1ft. European Alps, 1827. Annual.

C. maculata (spotted).* *fl.*, corolla yellow, marked with five dark purple spots on the tube; ventricose, five-cleft to the middle. June. *l.* cordate-ovate, quite entire, glabrous. *h.* 1ft. to 1½ft. South and Eastern Europe, 1804. Perennial.

C. major (largest).* *fl.*, corolla yellow at bottom and purple at top; ventricose at top, five-toothed. July. *l.* cordate-ovate, denticulately ciliated, all fleshy, stem-clasping, glabrous above, densely beset with white dots, rough beneath. *h.* 1ft. Switzerland, 1596. Annual. (B. M. 333.)

C. minor (smaller).* *fl.*, corolla yellow, sometimes with five brownish spots, five-cleft, with conniving segments. June. *l.* cordate-ovate, quite entire, glabrous, densely beset with minute white warts above. *h.* 1ft. to 1½ft. Middle and South Europe, 1570. Annual. (J. F. A. 2, 124.)

C. retorta (twisted).* *fl.*, corolla with a yellow tube and a violaceous limb, retorted, clavately cylindrical, with a constricted five-toothed mouth. July. *l.* stem-clasping, somewhat spathulate, emarginate at top, with a short mucrone, beset with white warts on both surfaces. *h.* 1½ft. Greece, &c., 1828. Annual. (S. F. G. 171.)

CERNUOUS. Inclining a little from the perpendicular; drooping.

CEROPEGIA (from *keros*, wax, and *pege*, a fountain; referring to the form and waxy appearance of the flowers). Ord. *Asclepiadaceæ*. Usually twining, sometimes erect, herbs, often with tuberous roots. Corolla funnel-shaped, more or less ventricose from the base; segments of the limb narrow, sometimes cohering at the apex. Leaves opposite. The corona consists of a single whorl of five to ten leaves, opposite the stamens, and alternating with the segments of the corolla. Ceropegias are very curious and pretty stove or greenhouse plants, thriving in a mixture of peat, sand, and vegetable mould. Cuttings of small side shoots, made in April, will root in sand, in heat, with or without a glass covering. They should have little or no water, when in a dormant state, particularly the bulbous-rooted kinds.

C. acuminata (taper-pointed). *fl.* large, erect, with a greenish tube, and a purple limb; segments united at apex; corolla ventricose at base; tube sub-clavate; peduncles many-flowered. June. *l.* linear-lanceolate, 2in. to 4in. long, hardly ¼in. broad, attenuated at apex. Root tuberous. Coromandel, 1820. Stove.

C. Barklyi (Barkly's).* *fl.* scarcely 2in. long, with a narrow, curved, pinkish tube, dilated into a globose base, and expanded above into a funnel-shaped limb, divided into five long filiform segments, coherent at the incurved tips. May. *l.* opposite, lanceolate, white-veined. Root tuberous. South Africa, 1877. Greenhouse. (B. M. 6315.)

C. Bowkeri (Bowker's). *fl.* solitary, shortly-stalked; sepals pale green, spotted with brown; corolla pale yellowish-green, 1½in. long (including the reflexed limb). *l.* linear, sub-acute, sessile. Root a tuber. *h.* 1ft. Caffraria, 1862. Greenhouse. (B. M. 5407.)

C. bulbosa (bulbous). *fl.* large, erect, with a greenish tube and a purple limb, having the segments united at the apex; tube of corolla sub-clavate; peduncles many-flowered, shorter than the leaves. April. *l.* from almost orbicular to lanceolate, acuminated. Root tuberous. Coromandel, 1821. Stove.

Fig. 411. Flowering Branch of Ceropegia elegans.

C. elegans (elegant).* *fl.* purple; corolla with a clavate tube, a hemispherical limb, and broad ligulate segments, which are shorter than the tube, and ciliated with long hairs; peduncles

Ceropegia—*continued.*

one to six-flowered, shorter than the leaves. *l.* oblong, or oblong-lanceolate, acuminated. Root fibrous. India, 1828. Stove. See Fig. 411. (B. M. 3015.)

C. Gardnerii (Gardner's).* *fl.* creamy-white, purple-blotched. *l.* lanceolate, acuminate, glabrous. Ceylon, 1860. An elegant greenhouse twiner. See Fig. 412. (B. M. 5306.)

C. juncea (Rush-like). *fl.* greenish yellow, and elegantly variegated with purple, large; corolla clavate, curved, ventricose at the base; peduncles few-flowered. *l.* small, sessile, lanceolate, acute. India, 1822. Stove.

C. Sandersoni (Sanderson's).* *fl.* pale green, mottled and veined with darker green, with a peculiar, translucid appearance, beautiful, large; the five petals uniting to form an umbrella-like cap, which is ciliated along the margin, with flat white, capillary processes; peduncles axillary, three to four-flowered. Summer. *l.* ovate-cordate, thick, fleshy, shortly petiolate. Natal, 1868. Greenhouse. (G. C. 1870, 173.)

C. stapeliæformis (Stapelia-like). *fl.* purple, sessile, rising from the axils of the leaves. July. *l.* very minute, ternate, almost invisible, cordate, cuspidate. Plant procumbent. Cape of Good Hope, 1824. Greenhouse.

C. Thwaitesii (Thwaites').* *fl.* with a narrow funnel-shaped tube, 1½in. long, very narrow below, but much widened above, and almost globose towards the top; tube yellow; the upper part of the corolla beautifully sprinkled with dark blood-red spots; produced in axillary, three to five-flowered, umbellate racemes. Ceylon, 1851. Stove. (B. M. 4758.)

C. Wightii (Wight's). *fl.* green, purple; corolla spherically ventricose at the base; tube slender; segments of the limb downy. August. *l.* ovate, acute, fleshy. Plant twining. *h.* 5ft. India, 1832. Stove.

CEROXYLON (from *keros*, wax, and *xylon*, wood; the trunk is coated with wax). ORD. *Palmæ*. A very handsome greenhouse Palm, for sub-tropical gardening perhaps unequalled, if placed in a sheltered situation, away from the direct rays of the sun. It thrives in a compost of loam and peat in equal parts. Increased by imported seeds.

C. andicola (Andes).* *fl.* sometimes perfect, at others unisexular; sepals and petals three-parted; spathe entire, quite covering the flower-spike. *l.* pinnate, 2ft. to 12ft. in length; petioles erect, somewhat ferruginous at the base, slightly arching at the apex; pinnæ acuminate, 2ft. in length, 1½in. in breadth, patent; upper side full, deep shining green; lower side silvery-white. *h.* 50ft. New Grenada, 1845.

CESPEDESIA (named after Juan Maria Cespedes, a priest of Santa Fé de Bogota). ORD. *Ochnaceæ*. A Theophrasta-like stove tree. For cultivation, *see* **Ochna.**

C. Bonplandii (Bonpland's).* *fl.* orange-yellow. *l.* very large, obovate, with a bicrenated margin, and the upper side strongly marked with transverse veins. Tropical America, 1878.

CESTRUM (from *Kestron*, an ancient Greek name). ORD. *Solanaceæ*. Including *Habrothamnus*. An extensive genus of stove, greenhouse, or half-hardy shrubs. Flowers cymose or fascicled; cymes corymbose or panicled; corolla with an elongated tube, widening gradually to the top; limb five-parted, sub-plicate, spreading or revolute, regular, conduplicate in æstivation. Leaves alternate, entire. This very ornamental genus of shrubs are useful subjects either as pot plants or as climbers; but plenty of pot room is, under all circumstances, necessary. A free and moderately rich soil is most suitable. Propagated by cuttings, in August, the same being potted off as frequently as the roots reach the sides of the pots. They should be pinched back early in January, to cause a bushy growth; the following season, they do better, as a rule, if potted and grown on in frames or out of doors. Where Cestrums are intended to be grown as wall-subjects, they should be planted out in the greenhouse or conservatory borders, and receive liberal treatment. They generally do well in a house where a temperature of about 40deg. or 45deg. is maintained during winter.

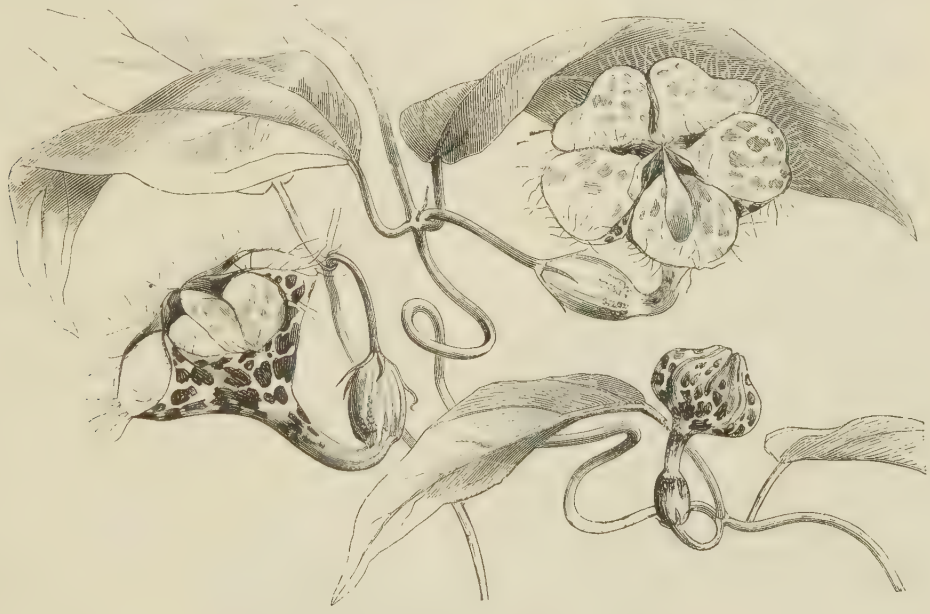


FIG. 412. FLOWERING STEMS OF CEROPEGIA GARDNERII.

C. alaternoides (Alaternus-like). *fl.* white, disposed in nearly sessile racemes. July to August. *l.* alternate, ovate, undulated, coriaceous, shining. *h.* 3ft. Trinidad, 1840. A stove evergreen shrub. (B. M. 2929.)

C. aurantiacum (orange).* *fl.* orange, sessile, spicate, panicled. August. *l.* oval, undulated. *h.* 4ft. Guatemala, 1843. An excellent cool-house evergreen shrub. (B. R. 1845, 22.)

C. corymbosum (corymbose). *fl.* red; corymbs terminal, forming a dense leafy panicle. May to June. *l.* ovate-lanceolate, entire. *h.* 5ft. Mexico, 1843. A handsome greenhouse evergreen shrub. SYN. *Habrothamnus corymbosus.* (B. M. 4201.)

C. elegans (elegant).* *fl.* purplish-red, numerously produced, in dense terminal cymes; petals ciliated. Summer. *l.* ovate-lanceolate. Branches and under sides of leaves downy. Mexico, 1844. A well-known greenhouse or half-hardy evergreen, with a climbing habit. SYN. *Habrothamnus elegans.* (B. R. 1844, 43.) The variety named *argentea* is one of the best climbers, having variegated leaves, the surface of which is creamy white, faintly tinged with rose, and relieved by irregular blotches of light green.

C. fasciculatum (fascicled).* *fl.* purplish-red, terminal, cymosely capitate, involucrated; corolla urceolate, with ciliated segments. Early spring. *l.* ovate, entire. Plant downy. *h.* 5ft. Mexico, 1843. A greenhouse evergreen shrub. SYN. *Habrothamnus fasciculatus.* (B. M. 4183 and 5659.)

C. Newelli (Newell's).* *fl.* bright crimson, large, produced in dense terminal clusters. *l.* neat, smooth. *h.* 6ft. This is described as a very ornamental greenhouse plant, of free growth. SYN. *Habrothamnus Newelli.*

Cestrum—*continued.*

FIG. 413. FLOWERING BRANCH OF CESTRUM PARQUI.

C. Parqui (Parqui). *fl.* whitish-yellow, disposed in panicles, very fragrant at night. June and July. *l.* lanceolate, 3in. to 6in. long, attenuated at both ends, sub-undulated. *h.* 7ft. Chili, 1787. This evergreen shrub will succeed in the open air if accorded the protection of a wall, and sheltered during winter. See Fig. 413. (B. M. 1770.)

C. roseum (rose).* *fl.* rose-coloured, sessile, capitate, involucrate; peduncles terminal and axillary, three to six-flowered, July. *l.* oblong, bluntish, downy. *h.* 4ft. Mexico, 1850. Greenhouse evergreen shrub. SYN. *Habrothamnus roseus.*

CETERACH. *See* **Asplenium.**

CETONIA AURATA. *See* **Rosechafer.**

CEUTORRHYNCHUS SULCICOLLIS. *See* **Cabbage Gall Weevil** and **Turnip Gall Weevil.**

CHACO, or **CHOCO.** *See* **Sechium.**

CHÆNESTES. *See* **Iochroma.**

CHÆNOSTOMA (from *chaino*, to gape, and *stoma*, a mouth; in reference to the wide throat of the corolla). ORD. *Scrophularineæ.* Very pretty greenhouse herbs or under-shrubs. Flowers axillary or racemose, on longish pedicels. Leaves nearly all opposite, toothed, rarely quite entire. They are of easy culture in ordinary garden soil. Seeds should be sown thinly in a hotbed, in March; and when the seedlings are large enough to handle, they should be pricked out thinly, and transferred to the flower garden, in May, where they will prove very ornamental throughout the summer. Cuttings may be made in autumn, and placed in a greenhouse or cold pit during the winter.

C. cordata (heart-shaped). *fl.* white, axillary, pedicellate. June. *l.* petiolate, ovate-roundish, toothed. Branches herbaceous, prostrate, somewhat radicant, hairy. *h.* 1½ft. South Africa, 1816.

C. hispida (hairy). *fl.* white, axillary, pedicellate; superior ones loosely racemose. June to August. *l.* ovate or oblong, coarsely toothed. Branches shrubby, procumbent or divaricate, hairy. *h.* 1ft. Cape of Good Hope, 1816. (R. G. 448.)

C. linifolia (Flax-leaved).* *fl.* white, yellow, racemose. November. *l.* oblong-lanceolate or linear, quite entire. *h.* 1ft. Cape of Good Hope, 1820. Shrubby. (P. F. G. iii., p. 7.)

Chænostoma—*continued.*

C. polyantha (many-flowered).* *fl.* lilac, yellow: corolla funnel-shaped; racemes loose. June. *l.* ovate, toothed, cuneated at the base; upper ones oblong. Herbaceous, much branched at the base. *h.* 4in. South Africa, 1844. (B. R. 33, 32.)

CHÆROPHYLLUM (from *chairo*, to rejoice, and *phyllon*, a leaf; in reference to the smell of the leaves). ORD. *Umbelliferæ.* An extensive genus of hardy herbaceous plants, of scarcely any horticultural interest. Flowers white, sometimes rosè; involucre none, or of few leaves; involucels of many leaves. Leaves decompound; leaflets toothed or multifid. All the species are of the easiest possible culture in any soil. Propagated by seeds, sown in the open, during spring.

C. bulbosum (bulbous). Bulbous-rooted Chervil. *fl.* white. June. *l.* supra-decompound; lower ones pilose at the petioles, superior ones glabrous; segments multifid, linear. Stem beset with retrograde hairs at the bottom. *h.* 3ft. to 6ft. Europe, &c., 1726. *See also* **Chervil, Bulbous-rooted.**

CHÆTANTHERA (from *chaite*, a bristle, and *anther*, an anther; the anthers being furnished with tufts of bristly hairs). ORD. *Compositæ.* Pretty half-hardy herbaceous annuals or perennials, allied to *Ainslæa.* Involucre many-leaved, ciliated; florets of ray linear, three-toothed, with a fine bifid spiral segment at the divisions; receptacle flat, naked; pappus hairy. They thrive best in a compost of peat and loam. Propagated by divisions of the root, in March or April; or by seeds, sown in gentle heat, in spring.

C. ciliata (ciliated). *fl.-heads* **yellow. July.** *h.* **2ft. Chili,** 1822. Annual.

C. serrata (saw-leaved). *fl.-heads* golden yellow, solitary, terminal. *l.* narrow, channelled, armed with short spiny teeth. *h.* 6in. Chili, 1832. Perennial. (S. B. F. G. ser. ii., 214.)

CHÆTOCALYX (from *chaite*, a bristle, and *kalyx*, a calyx; in reference to the calyx being covered with spiny bristles). ORD. *Leguminosæ.* Stove evergreen twiners. For culture, *see* **Clitoria.**

C. vincentinus (St. Vincent). *fl.* yellow; pedicels filiform, one-flowered, rising in numbers from the axils of the leaves. May, August. *l.* impari-pinnate, with two pairs of oval, mucronate, exstipellate leaflets. Stipules lanceolate-linear, spreading, deflexed. West Indian Islands, 1823. SYN. *Glycine vincentina.* (B. R. 799.)

FIG. 414. FLOWERING BRANCH OF CHAMÆBATIA FOLIOLOSA.

CHÆTOGASTRA (from *chaite*, a bristle, and *gaster*, a belly; in allusion to the tube of the calyx being beset with bristles or scales). ORD. *Melastomaceæ*. The plants formerly placed here are now generally distributed in the genera *Brachyotum* and *Pleroma*. Greenhouse or stove shrubs or herbs, for the most part clothed with strigose hairs. Flowers terminal. Leaves three to five-nerved, quite entire, or hardly serrulated. They are of easy culture in peat and loam. Propagated by seeds, sown in March; or by cuttings (of the perennials), in sandy peat.

C. gracilis (slender).* *fl.* red, lilac, axillary; pedicels one-flowered; terminal ones three-flowered. *l.* almost sessile, lanceolate-linear, acute, quite entire, villous. Plant erect, nearly simple, naked at the apex. *h.* 1ft. Brazil, 1848. Greenhouse perennial.

C. lanceolata (lance-shape-leaved) *fl.* white; peduncles trichotomous, axillary and terminal. January. *l.* petiolate, broadly lanceolate, acuminated, serrulately ciliated, villous on both surfaces. *h.* 1ft. Peru, 1820. Stove annual.

C. strigosa (short-bristled).* *fl.* rosy-purple; cymes terminal, pedunculate, few-flowered. August. *l.* on short petioles, ovate, acute, hardly three-nerved, quite entire, with a few thick, scattered, adpressed bristles on the upper surface. *h.* 1ft. West Indies, 1848. Greenhouse evergreen shrub.

CHALAZA. That part of a seed where the nucleus joins the integuments.

CHAMÆBATIA (from *chamai*, on the ground, dwarf, and *batos*, a bramble; referring to its low growth and bramble-like flowers). ORD. *Rosaceæ*. A very pretty half-hardy evergreen shrub, thriving in a cool frame or greenhouse, in light loam, to which may be added a little peat. Cuttings should be struck in sand, in a cool frame.

C. foliolosa (leafleted).* *fl.* white, about ⅜in. in diameter; cymes four to five-flowered, terminal. *l.* broadly-ovate, about 2in. long, tripinnately dissected. Young shoots clothed with a glandular pubescence. *h.* 2ft. to 3ft. Sierra Nevada, 1859. See Fig. 414. (B. M. 5171.)

CHAMÆCISTUS. *See* **Rhododendron Chamæcistus.**

CHAMÆCYPARIS (from *chamai*, on the ground, *i.e.* dwarf, and *Kuparissos*, *Cypress*; the Bastard or Dwarf Cypress). White Cedars. SYN. *Retinospora*. ORD. *Coniferæ*. Hardy evergreens. The present genus ranks extremely close to *Cupressus*, the principal distinction between the two being the more numerous ovules beneath the fertile scales of the latter. They are very pretty, and thrive best in a moist soil, in a rather protected situation. Propagated freely by seeds; but mainly by cuttings, put in during October. Select young side shoots, with a heel; insert in well-drained pots of sandy soil, and place in a close cold frame, keeping fairly moist through the winter. In February, they will be calloused, and should be placed in gentle heat; they will then root freely. This genus, like most others of the same order, is overloaded with synonyms, and mere varieties are often elaborated into species—most of them known in gardens under the name of *Retinospora*, others as *Cupressus*.

C. Boursierii (Boursier's). A synonym of *C. Lawsoniana*.

C. decussata (decussate). A synonym of *C. ericoides*.

C. ericoides (Heath-like). *l.* linear, spreading, densely arranged in four ranks on the slender branchlets, somewhat rigid and acute; bright green above, glaucous beneath, assuming a ruddy tint in winter. Branches very numerous, furnished with short branchlets. *h.* 3ft. to 4ft. A well-known dwarf, compact, conical bush, of garden origin. SYNS. *C. decussata*, *Retinospora decussata* and *juniperoides*.

C. filicoides aurea (golden fern-like). A synonym of *C. tetragona aurea*.

C. filifera (thread-bearing).* *l.* subulate, pointed, distant, in alternate pairs, fulvous-green colour. Branches spreading; secondary ones alternate, long, distant, furnished, on one side principally, with numerous thread-like pensile branchlets of various lengths; terminal ones longer, filiform. Japan, 1867. A dwarf tree, with irregular outline. SYN. *C. pisifera filifera*.

C. Keteleeri (Keteleer's). A synonym of *C. obtusa*.

C. Lawsoniana (Lawson's).* *fl.*, male catkins bright crimson, terminal, numerous, produced when the trees are in a young state. *l.* dark glossy green, more or less tinged with a glaucous hue, very minute and closely imbricated, obtuse or acute, usually furnished with an obscure tubercle towards the apex, *cones* about the size of large peas, and produced in great profusion. Branches short, and spreading; branchlets crowded.

Chamæcyparis—*continued.*

pendulous, fern-like, and feathery. Trunk comparatively slender. *h.* 75ft. to 100ft. North California, 1853. A very splendid hardy evergreen tree, usually known in gardens under the name of *Cupressus*. It is easily propagated by seeds, but the numerous beautiful varieties are best increased by grafting upon seedling

FIG. 415. CHAMÆCYPARIS LAWSONIANA.

stocks of the species. SYNS. *C. Boursierii* and *Cupressus Lawsoniana*. See Fig. 415. The varieties of this species are extremely numerous; the following are described as being the best, in Veitch's "Manual of Coniferæ":

C. L. albo-spica (white-spiked.)* Terminal growth and tips of the branchlets creamy-white. Growth rapid, but less dense than the type.

C. L. albo-variegata (white-variegated).* Branchlets and foliage very deep green, profusely spotted and blotched with white. Of dwarf, compact, and conical habit.

C. L. argentea (silvery).* Branches longer and more slender than those of the type; foliage of almost silvery whiteness.

C. L. argenteo-variegata (silvery-variegated).* Many branchlets and leaves creamy-white, interspersed among the deep green foliage.

C. L. aureo-variegata (golden-variegated).* This differs from the type in having many of its branchlets bright yellow.

C. L. erecta-viridis (erect-green).* Habit fastigiate and tapering, with foliage of a lighter and brighter green than the type. It is very ornamental and distinct.

C. L. filiformis (thread-like). Branches excessively elongated. Habit sub-pendulous.

C. L. gracilis pendula (gracefully pendulous).* Branches long, gracefully pendulous. A handsome lawn plant, of vigorous growth.

Chamæcyparis—*continued.*

C. L. intertexta (interwoven).* A variety more robust in all its parts, so that the ultimate branchlets appear more divaricate than in the type. Foliage with a peculiar glaucous hue.

C. L. lutea (yellow).* Whole of young growth light clear yellow. Of medium growth and compact habit.

C. L. nana (dwarf).* A diminutive variety, of slow growth; dense in habit, globose in outline, and deep green in colour.

C. l. n. alba (white). All the young growth yellowish-white; light green when mature.

C. L. n. glauca (glaucous)* resembles *nana*, but differs in its highly glaucous foliage.

C. leptoclada (slender-branchleted).* *l.* of two forms; primordial ones linear awl-shaped, recurved, and light glaucous green; later ones scale-like, closely appressed to the branchlets, and deeper in colour. Branches close-set, short, sub-erect, much divided; branchlets flattened, fern-like, clustered towards the extremities of the branches and their many sub-divisions. *h.* 8ft. to 10ft. Japan. Habit pyramidal. SYN. *Retinospora leptoclada.*

FIG. 416. CONES AND LEAVES OF CHAMÆCYPARIS NUTKAENSIS.

C. nutkaensis (Nootka Sound).* *l.* small, closely imbricated, very acute, destitute of tubercles, rich dark green, slightly glaucous on the lower surface or shady side of the branches. Branches sub-erect; branchlets distichously arranged, with elegantly recurved extremities. *h.* 40ft. to 60ft. British Columbia, 1850. A very fine hardy species, with a nearly columnar form. SYN. *Thujopsis borealis.* See Fig. 416. The names of the varieties, *argenteo-variegata* (silvery-variegated), *aureo-variegata* (golden-variegated), *compacta* (compact), *glauca* (glaucous), *pendula* (pendulous), *variegata* (variegated), and *viridis* (green), sufficiently explain their respective characteristics.

C. obtusa (obtuse-leaved).* *l.* mostly in whorls of four, ovate-rhomboid, blunt, seldom pointed, decussate, all scale-formed, closely pressed along the branchlets, and adhering almost as far as the points, the lower part only being visible. Branches spreading; lateral ones in two rows, very dense, spreading out like a fan, and of a light green colour. *h.* 70ft. to 100ft. Japan. A tall evergreen tree. SYNS. *C. Keteleeri* and *Retinospora obtusa.*

C. o. albo-picta (white-spotted). Many of the young shoots creamy-white, thus giving the plant a speckled and spotted appearance

C. o. aurea (golden).* This differs from the typical species in having a portion of the smaller spray and leaves of a golden colour, intermixed with the usual glossy green ones. Japan. A very desirable plant for small gardens, being quite hardy.

Chamæcyparis—*continued.*

C. o. compacta (compact). Stem much divided at the base. Branches crowded and more dense than in the type.

C. o. filicoides (fern-like).* *l.* small, oval, curved, thick in texture, and somewhat obtusely pointed, keeled on the back, thickly and rather loosely imbricated in four rows, and of a deep glossy green colour. Branches long, narrow, flat, regularly and thickly furnished on both sides with short branchlets of a deep green colour on the upper surface, and more or less glaucous beneath. Japan. A free-growing, quite hardy tree. SYN. *Retinospora filicoides.*

C. o. gracilis aurea (slender golden).* A very graceful form, with spreading branches, which are elongated at their extremities into slender, rather pendulous stems, furnished with short branchlets; young foliage light, clear yellow, but ultimately light green. Habit pyramidal.

C. o. lycopodioides (Club-moss-like).* *l.* variously shaped, and thickly arranged all round the shoots; those on the upper parts of the principal branchlets being more or less terete-pointed, or bluntly awl-shaped; those near the base of the principal shoots, and on the lesser spray, are more or less scale-formed, adpressed in opposite pairs, keeled on the back, oval-shaped, closely imbricated, all of a deep glossy green colour. Branches spreading, rather slender; branchlets numerous, short, linear. Japan, 1861. A fine evergreen tree. SYN. *Retinospora lycopodioides.*

C. o. nana (dwarf).* A very singular variety, forming a dwarf, cushion-shaped little bush, and seldom attaining a height of more than 1ft. or 2ft., but spreading out horizontally all round to more than double that distance. Japan. Quite hardy, and forms an interesting object for rockwork or miniature gardens. SYN. *Retinospora obtusa pygmæa.*

C. o. plumosa (feathery).* *l.* subulate or awl-shaped, sub-erect or spreading, acute. Branches numerous, sub-erect, thickly furnished with lateral shoots. *h.* 15ft. to 20ft. Japan. A dense-growing species, with a conical habit. The varieties of this are extremely beautiful dwarf shrubs, with flexible feathery branchlets.

C. o. p. albo-picta (white-spotted).* Many of the branchlets pure white, imparting a speckled appearance to the plant.

C. o. p. argentea (silvery).* Nearly the whole of the young growth creamy-white, becoming green when mature.

C. o. p. aurea (golden).* Young shoots and foliage of a light golden-yellow, gradually becoming deep green as the season advances. Very distinct and ornamental.

C. o. tetragona aurea (golden tetragonal).* *l.* short, scale-like, golden-yellow until the second year, when they assume a deep green colour. Branches horizontal, tufted at the extremities with short, undivided, tetragonal branchlets. Garden variety. SYN. *C. filicoides aurea.*

C. o. variegata (variegated). This only differs from the ordinary *C. obtusa* in the branchlets being more or less tinged with yellow.

The above list by no means completes the list of varieties of this very variable species. A large number of different forms may be selected from any seed bed, but the above-named are the best.

C. pisifera (Pea-bearing).* *l.* in four rows, decussate, all scale-formed on the adult plants; upper and lower ones ovate-lanceolate, tapering to a hard point, keeled on the back, and smooth; lateral ones almost sickle-shaped, equally long, acute-pointed, marked on the under side with two white glaucous bands. Branches numerous, thickly covered with branchlets. Japan. A much smaller and more slender tree than *C. obtusa.*

C. p. argenteo-variegata (silvery-variegated). This variety has its shoots variegated with white.

C. p. aurea (golden).* Terminal shoots of a golden hue. Japan, 1861.

C. p. filifera (thread-bearing). A synonym of *C. filifera.*

C. sphæroidea (spherical). White Cedar. *l.* very minute, closely imbricated, furnished with a small tubercle about the centre, light green, soon falling from the older branches. *cones* small globular bodies, about the size of peas. Branches spreading, much ramified; branchlets slender, not plaited. Trunk slender, tapering. *h.* 40ft. to 70ft. North America, 1736. SYN. *Cupressus thyoides.*

C. s. glauca (glaucous) A synonym of *C. s. kewensis.*

C. s. kewensis (Kew).* This variety differs from the species in being more compact, denser, and in having the branchlets and leaves of a silvery-glaucous colour. Very handsome. SYN. *C. s. glauca.*

C. s. variegata (variegated).* A handsome low or medium-sized tree, on which more than half the branchlets, with their foliage, are of a rich golden-yellow. It requires a damp, moist situation.

C. squarrosa (squarrose-leaved).* *l.* spiral, or in whorls, spreading, linear, sharp-pointed, decurrent, dense, smooth, and frequently bent or curved backwards, but somewhat scale-formed; those on the young plants are larger, linear, sharp-pointed, spreading, reflexed, bright glaucous-green above, and furnished with two white glaucous bands on the under side. Branches slender, gracefully curved towards the extremities; branchlets numerous, spreading in all directions, and thickly furnished with extended leaves. *h.* 4ft. to 6ft. Japan. A large bush or small tender tree. SYN. *Retinospora squarrosa.*

CHAMÆDOREA (from *chamai*, dwarf, and *dorea*, a gift; referring to the fruits of this Palm being easily reached). SYNS. *Nunnezia*, *Nunnezharia*. ORD. *Palmæ*. A rather large genus of stove Palms, very extensively grown, and universally admired. Flowers dicœcious, appearing below the crown of the leaves. Fruit a berry, generally a little larger than a pea, with a fine polish, and of a bright colour. Leaves usually pinnatisect, but in a few species entire. Trunk ringed, polished, scarcely thicker than a man's finger. Plant unarmed. The species are invariably found growing under the shade of tall forest-trees, and never in exposed situations. Essentials, therefore, to their successful culture in our stoves are shade and moisture. They succeed best in a compost of two parts spongy peat, one part loam, and one of sand; the whole well mixed together.

C. Arenbergiana (Arenberg's).* *l.* pinnate, 2ft. to 3ft. long; pinnæ 12in. long and 4in. broad, pendent, tapering to a tail-like point, bright green. Stem slender. Guatemala. SYNS. *C. latifrons* and *C. latifolia*.

C. atrovirens (dark green). A synonym of *C. Martiana*.

C. brevifrons (short-fronded). *l.* pinnate, arching, 12in. to 18in. in length; pinnæ sessile, 1in. to 2in. broad, tapering to a point, dark green. Stem slender. New Grenada. Very distinct.

C. desmoncoides (Desmoncus-like).* *l.* pinnate, 2ft. to 3ft. long; pinnæ 12in. long, 1in. to 1½in. broad, pendent, dark green. Stem slender and, as well as the petioles, glaucous. Mexico, 1846. An elegant species, which assumes a climbing habit after reaching a height of about 6ft. SYN. *C. scandens*.

C. eburnea (ivory). *l.* pinnate, broad, very bright green, which contrasts well with the ivory-white midrib which runs through the blade, and is apparent on both surfaces. Stems and petioles perfectly smooth and somewhat glaucous. Columbia, 1876.

C. elatior (taller). *l.* bright green, pinnate, with broad leaflets. South Mexico. This is perhaps the tallest-growing of all the Chamædoreas. It is suitable for growing up the pillars, and training along under the roof, of a large stove.

C. elegans (elegant).* *l.* pinnate, 2ft. to 4ft. long, gracefully pendent; pinnæ 6in. to 9in. long, 1in. broad in the centre, tapering towards each end, bright dark green; petioles somewhat carinate, sheathing at the base. Stem stout. *h.* 4ft. Mexico. SYNS. *C. Helleriana* and *Kunthia Deppeana*. (G. C. 1873, 508.)

C. Ernesti-Augusti (Ernest Augustus').* *fl.* spikes bright orange-scarlet, and extremely ornamental while they last. *l.* rich dark green, simple, 2ft. long, 1ft. broad, deeply bifid at the apex. New Grenada. SYN. *C. simplicifrons*. (B. M. 4831, 4837.)

C. formosa (beautiful).* *l.* pinnate; pinnæ very numerous, alternate, linear-lanceolate, 18in. long, and about 3in. wide, elongated to a thread-like point; petiole smooth, with two channels on the face. Tolima, South America, 1876. (G. C. 1876, 724.)

C. fragrans (fragrant). *fl.* spikes in long drooping panicles. *l.* bright green, pinnate, gracefully recurved; pinnæ numerous, narrow, acuminate. Mexico, 1850. SYN. *Morenia fragrans*. (B. M. 5492.)

C. geonomiformis (Geonoma-formed).* *l.* entire, bifid at the apex, 6in. to 12in. in length, 4in. to 5in. in breadth, dark green. Stem slender. *h.* 4ft. Guatemala, 1856. A very beautiful dwarf-growing species. SYN. *Nunnezharia geonomiformis*. (B. M. 6088.)

C. glaucifolia (glaucous-leaved).* *l.* long, pinnate; pinnæ narrow, long, and slender, dark green, suffused with a glaucous hue. Guatemala. *h.* 20ft. An elegant slender-growing species, and one of the best for decorative purposes.

C. graminifolia (Grass-leaved).* *l.* pinnate, 2ft. to 4ft. long, rich dark glaucous green, gracefully arched; pinnæ upwards of 1ft. long, about ½in. broad. Stem reed-like. Costa Rica. This is described as probably the most graceful species of the genus, the whole plant having the appearance of a plume of feathers.

C. Helleriana (Heller's). A synonym of *C. elegans*.

C. latifolia (broad-leaved). A synonym of *C. Arenbergiana*.

C. latifrons (broad-fronded). A synonym of *C. Arenbergiana*.

C. Lindeniana (Linden's). *l.* pinnate, spreading; pinnæ broadly oblong, or oblong-lanceolate, falcate, long acuminate; primary and secondary nerves eleven to thirteen. Mexico.

C. lunata (crescent-shaped). A synonym of *C. oblongata*.

C. macrospadix (large-spadix). *l.* pinnate, upwards of 4ft. long, gracefully curved; pinnæ 12in. to 18in. long by 2in. broad, dark green. Stem somewhat stout. Costa Rica. A very handsome plant, and one of the largest-growing species in the present genus.

C. Martiana (Martius's). *l.* pinnate, spreading; pinnæ pendent, 6in. to 8in. long, hardly 1in. broad, deep green. Chipias. A very useful dwarf spreading species, producing many little dichotomous stems. SYN. *C. atrovirens*.

C. mexicana (Mexican). A synonym of *C. Sartorii*.

Chamædorea—*continued.*

C. microphylla (small-leaved).* *l.* pinnate, 6in. to 10in. long, prettily arched; pinnæ ovate-cordate, about 4in. long and 1½in. wide, very deep green. Stem slender, dark green, mottled with white dots. Tropical America. An elegant pigmy palm, The branching flower-spikes are produced from below the crown of leaves when the stem is only about 2in. high.

C. oblongata (oblong). *l.* pinnate, long, dark green; pinnæ somewhat lunate. Stem moderately stout. Tropical America. An elegant species, well adapted for decorative purposes. SYN. *C. lunata*.

FIG. 417. CHAMÆDOREA SARTORII.

C. Sartorii (Sartor's).* *fl.* spikes bright red. *l.* longer, more numerous, and pinnules broader, than in *C. elegans*, which species it otherwise much resembles. Mexico. A very handsome species. SYNS. *C. mexicana* and *Morenia oblongata conferta*. See Fig. 417.

C. scandens (climbing). A synonym of *C. desmoncoides*.

C. simplicifrons (simple-fronded). A synonym of *C. Ernesti-Augusti*.

C. tenella (slender). *fl.* yellow, spiked, ebracteate and ebracteolate; male ⅓in. long. *l.* shortly petioled, 4in. to 5in. long by 3in. broad, spreading, convex, remotely obtusely serrate, bifid for one-third of their length; nerves eight or nine pairs. Spadices as long as the palm, drooping, slender, unbranched; males longest, with most numerous and much the largest flowers; rachis slender, but stouter than the peduncle, yellowish; peduncles very slender; spathes membranous. One of the most diminutive of all Palms. Mexico. (B. M. 6584.)

C. Tepejilote (native name). *l.* pinnate; pinnæ rich deep green, pendent. Stem slender. *h.* 10ft. Mexico, 1860. A very graceful species, but somewhat rare in cultivation. (B. M. 6030.)

C. Warscewiczii (Warscewicz's). *l.* beautifully curved, long, pinnate; pinnæ broad, sessile, tapering to a point; terminal pinnæ broad, bifid. Guatemala.

C. Wendlandi (Wendland's).* *l.* pinnate; pinnæ 1ft. long, upwards of 2in. broad, sessile; apex acuminate, rich shining green. Stem slender. Mexico. This is one of the best for decorative purposes.

CHAMÆLAUCIACEÆ. A tribe of *Myrtaceæ*.

CHAMÆLAUCIUM (from *chamaileuke*, a dwarf white Poplar, because its healthy stems are miniatures of that tree; this meaning is not very clear). ORD. *Myrtaceæ*. A very ornamental little greenhouse evergreen shrub.

Chamælaucium—*continued.*

Flowers white, axillary, subtended by two concave bracteoles, which fall off in a calyptra from the young bud. Leaves opposite, crowded, linear, triquetrous. For culture and propagation, *see* **Calythrix.**

C. ciliatum (hair-fringed). *fl.*, tube of calyx striated, glabrous, with the lobes roundish and ciliated. May. *h.* 2ft. West Australia, 1825.

CHAMÆLEDON PROCUMBENS. *See* **Loiseleuria.**

CHAMÆPEUCE (from *chamai*, dwarf, and *peuke*, a Pine; resemblance). ORD. *Compositæ*. This genus is now usually included under *Cnicus*. Nearly hardy herbaceous plants, differing from *Cnicus* proper in the covering of the achenes being hardened, not membranous; and from *Carduus* in the pappus being feathery, not simple. Flower-heads from 1in. to 2in. in diameter, generally arranged in corymbs or long leafy racemes. Leaves usually lanceolate, with very spiny margins. Of the entire genus, the only two worth much attention are *C. Casabonæ* and *C. diacantha*. Both these are effective for sub-tropical gardening and carpet bedding, growing in compact rosette-like patches, and not producing stems or flower-heads until the second year. Propagated by seeds, sown in gentle heat, in February, and also in September, in which latter case the young seedlings should be potted up and kept indoors throughout the winter months.

C. Casabonæ (Casabona's). Fish-bone Thistle. *fl.-heads* pale purple. Summer. *l.* deep green, veined with white, spiny. *h.* 2ft. to 3ft. South Europe, 1714.

C. diacantha (two-spined). *fl.-heads* purplish, in dense, spike-like clusters. Summer. *l.* shining green, marked with silvery lines; spines ivory-white. *h.* 2ft. to 3ft. Syria, 1800.

C. stricta (upright). *fl.-heads* purple. Summer. *l.* veined with white. *h.* 2ft. South Europe, 1820. A neat and dwarf-growing species, sometimes seen in gardens.

CHAMÆRANTHEMUM (from *chamai*, dwarf, and *anthos*, a flower). ORD. *Acanthaceæ*. Stove plants, thriving best in a well-drained peat and loam compost. Cuttings of young shoots will root in spring, if planted in sand and placed in heat.

C. Beyrichii variegatum (Beyrich's variegated). *fl.* white. *l.* rather large, oval, marked with a broad, irregularly-margined greyish band along the centre. Brazil, 1866. (B. M. 5557.)

C. igneum (fiery). *fl.* yellow. *l.* with red veins. Peru. (R. G. 598.)

C. pictum (painted).* *l.* sessile, obovate-oblong, tapering at the base and shortly acuminate at the apex; colour green, with orange edges, and a large, irregular, central silvery blotch; young leaves covered with short, stiff, appressed orange-coloured hairs. Brazil, 1878.

CHAMÆRHODOS (from *chamai*, on the ground, and *rodon*, a rose; dwarf rose). ORD. *Rosaceæ*. Pretty hardy herbaceous perennials, allied to *Potentilla*, but difficult to preserve through the winter, owing to excessive damp. Flowers white or purple, erect, solitary or paniculate, small. Leaves alternate, three-parted; divisions again split up into linear segments. They should be grown under a well-drained ledge of the rockery, or in pots, in a mixture of sand, peat, and loam; and should be placed on a dry shelf, in a cold frame, in winter, at which time they must be but sparingly watered, if at all. Increased by seeds, which should be sown as soon as ripe, in pots, in a cold frame.

C. erectus (erect). *fl.* white; petals about equal in length to the calyx. July to August. *l.* multifid; segments linear. Stem straight, beset with glandular hairs, panicled. *h.* 6in. Rocky Mountains, &c., 1824.

C. grandiflora (large-flowered). *fl.* white; petals twice the length of the calyx. June. *l.* divided into numerous linear segments, pubescent. Stems numerous, erect, leafy. *h.* 6in. Dahuria, 1828.

CHAMÆROPS (from *chamai*, on the ground, and *rhops*, a bush; alluding to the low growth of the plants). ORD. *Palmæ*. A genus comprising two species of ornamental greenhouse Palms. The petioles are furnished with prickles, the blade is fan-shaped, the inflorescence axillary and polygamo-dioecious, whilst the fruits are generally

Chamærops—*continued.*

one-seeded, and resemble Olives in appearance. *C. humilis* is frequently employed in sub-tropical gardening, for which purpose it should have a situation sheltered from strong winds. The species are of very easy culture in a compost of rich strong loam, to which is added a small portion of vegetable mould and sand; perfect drainage, and copious supplies of water throughout the summer, are most essential to success. Propagation may be effected by suckers, which generally appear in considerable quantities; or by seeds. *See also* **Rhapidophyllum, Sabal,** and **Trachycarpus.**

C. humilis (dwarf).* *l.* glaucous on both surfaces, divided about one-third their length into narrow, erect segments; petioles glaucous, 3ft. to 4ft. in length, armed at the edges with stout spines. *h.* 20ft. (usually about 4ft. to 6ft. in English gardens). South Europe and North Africa, 1731. In its native home, this species is seen to most perfection. It is very fine, and well worthy of greatly extended cultivation.

C. macrocarpa (large-fruited).* A robust growing form, with a stout stem and larger fruit than the foregoing species. It has a hardy constitution, and is an excellent plant for decorative purposes. Northern Africa.

CHAMISSOA (commemorative of the naturalist, Louis Charles Albert von Chamisso, born at Boncourt in Champagne, in 1781; died at Berlin in 1838). ORD. *Amarantaceæ*. A genus containing some six or eight species, from tropical and sub-tropical South America. Some of the species now referred here were formerly placed under *Achyranthes*, a genus of about a dozen species, of merely botanical interest. Chamissoas thrive well in loam and leaf mould. They may be readily increased by seeds; or by cuttings, inserted in sand, in bottom heat. The only species worth mentioning here is the following:

C. altissima (tallest). *fl.* whitish, in branched terminal and axillary panicles. *l.* stalked, ovate-lanceolate, acuminate, hairy beneath. A tall herbaceous greenhouse or stove perennial.

CHAMOMILE, or **CAMOMILE** (*Anthemis nobilis*). A perennial herbaceous plant, at one time—and still to a considerable extent—in repute as a medicinal agent. It has both tonic and febrifugal properties, and thrives on any light rich soil, if fairly dry. The plants may be raised from seed, but the quickest way of propagation is by dividing the roots in spring, and replanting in small patches, about 9in. apart. They must be watered when dry, until established, and kept clear of weeds. The flowers, which alone are used, should be picked as soon as fully expanded, in fine, sunny weather, placed thinly in a shady place to dry, and turned over occasionally. As the blossoming season lasts for some time, several pickings may be made. There are two varieties—the Single and the Double-flowered. The latter produces the greater bulk of flowers, and is, consequently, most cultivated. The flowers of the Single variety are, however, of the best medicinal quality.

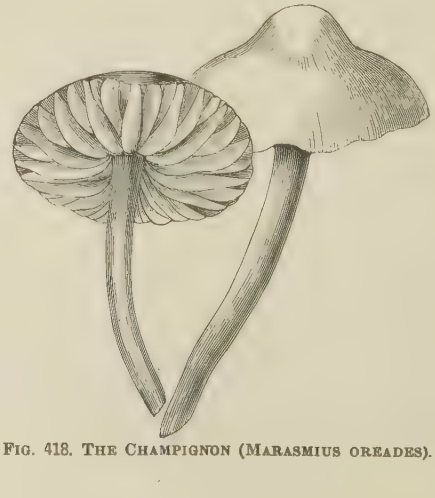


FIG. 418. THE CHAMPIGNON (MARASMIUS OREADES).

CHAMPIGNON (*Marasmius oreades*). This has long been known as an esculent mushroom, and it is greatly esteemed throughout France. It is sometimes described in books as the Fairy-ring Mushroom, but several others have an equal claim to that title. It may be readily distinguished from the closely allied poisonous species, *M. urens*, with which it sometimes grows, in having the stem quite bare, and in its less crowded gills. See Fig. 418.

CHANDELIER-TREE. *See* **Pandanus candelabrum.**

CHANNELLED. Hollowed out, like a gutter.

CHANTARELLE (*Cantharellus cibarius*). This is one of the most distinct, best-known, and most generally appreciated of fungi. It is almost always a woodland species, growing either singly or in patches, and appearing from the latter end of August until the end of October or the beginning of November. The stem, which is short and thick, expands gradually into the pileus, which is smooth and funnel-shaped. The gills are thick and branched, and, owing to the shape of the pileus, seem to extend for some distance down the stem, having rather the appearance of folds (see Fig. 419). The Chantarelle is throughout of a deep rich yellow colour, and possesses a peculiar but pleasant smell. This species seems most abundant in the southern parts of the country, being found in large quantities in various parts of Kent, Surrey, Buckinghamshire, Berkshire, Essex, and the neighbouring counties. In France, the Chantarelle enjoys a general and well-deserved popularity. It is employed in fricassées, or cooked with butter, lard, and oil; vinegar, salt and onions being added at discretion. It is sometimes preserved in vinegar, with pepper, salt, and garlic; or simply dried, in which case it is employed as a seasoning for ragouts.

FIG. 419. THE CHANTARELLE (CANTHARELLUS CIBARIUS).

CHAPTALIA (named after M. Chaptal, a celebrated French chemist, 1756-1831). ORD. *Compositæ*. A genus comprising about eighteen species, confined to the New World; perhaps the only one in cultivation being that mentioned below. It is an ornamental hardy herbaceous perennial, easily grown in a light sandy soil. Propagated by divisions of the roots, in early spring.

Chaptalia—*continued.*

C. tomentosa (tomentose).* *fl.-heads* white; pappus capillary; receptacle naked; ray-florets in a double row, deformed; scape naked, one-headed; head nodding. May. *l.* ovate-oblong, entire, silvery beneath. *h.* 6in. North America, 1806. (B. M. 2257.)

CHARCOAL is the main solidifying element of organic nature, and is present in large quantities in all organised structures. It is a pure form of Carbon. The powers of Charcoal in absorbing effluvia and the greater number of gases and vapours is well known, and as a filter Charcoal Powder has long been used to deprive water of its numerous organic impurities. As a manure, Charcoal is of especial value. It may be mixed, either crushed or in lumps, with the soil of pot plants, in the proportion of one part Charcoal to sixteen parts of earth. Besides rendering the soil porous and facilitating drainage, Charcoal is one of the most indestructible substances known, and has the property of absorbing carbonic acid and other gases, yielding these up to plants as required for nourishment. It may be applied to the most delicate subject without danger. Pieces, the size of walnuts, should be put in Hyacinth glasses, in order to keep the water pure during the growth of the Hyacinth. It is often thought necessary to add some to water in which grapes are placed when cut, but water will keep good without it so long as the Vine shoot is inserted. The roots of Orchids cling to Charcoal in many cases much better than to anything else.

CHARIEIS (from *charieis*, elegant; alluding to the beauty of the flowers). ORD. *Compositæ*. An ornamental hardy annual, with a very compact habit of growth, and free-flowering qualities. Involucre simple; leaflets keeled; receptacle naked, convex. Seeds may be sown out of doors in ordinary soil, about the middle of April; or, if an early display is desired, they may be sown on a hotbed in March, and transplanted out when large enough to handle.

C. heterophylla (various-leaved). *fl.-heads*, ray-florets blue, disk blue or yellow; peduncle long, one-headed, glandular. June. *l.*, lower ones opposite; upper alternate, oblong-lanceolate. *h.* 1ft. South Africa, 1819. SYN. *Kaulfussia amelloides*. (B. R. 490.)

CHARLOCK. *See* **Sinapis arvensis.**

CHASCANUM (from *chaino*, or *chaskaino*, to gape; in allusion to the form of the calyx). ORD. *Verbenaceæ*. All the plants formerly referred here are now included under genus **Bouchea** (which *see*).

CHAVICA. *See* **Piper.**

CHEESE RENNET. *See* **Galium verum.**

CHEILANTHES (from *cheilos*, a lip, and *anthos*, a flower; in reference to the form of the indusium). ORD. *Filices*. The following names, formerly looked upon as representing distinct genera, are now merely regarded as sectional ones of the genus *Cheilanthes*—*Adiantopsis*, *Aleuritopteris*, and *Physapteris*. A large genus of hardy, greenhouse, and stove Ferns. Sori terminal, or nearly so, on the veins, at first small, sub-globose, afterwards more or less confluent. Involucre formed from changed reflexed margin, roundish and distinct, or more or less confluent, but not quite continuous. For general culture, *see* **Ferns.**

C. argentea (silvery).* *sti.* densely tufted, 3in. to 6in. long, wiry. *fronds* 3in. to 4in. long, 2in. broad, deltoid, bi- or tripinnatifid; lower pinnæ much the largest, cut down nearly to the rachis; lowest pinnules sometimes ½in. long; lower surface thickly covered with white ceraceous powder. *sori* numerous, very small, marginal. Siberia to India, &c. Greenhouse species.

C. Bradburii (Bradbury's). A synonym of *C. tomentosa*.

C. capensis (Cape).* *sti.* tufted, erect, 4in. to 6in. long. *fronds* 4in. to 6in. long, 3in. to 4in. broad, bipinnatifid; lower pinnæ much the largest; pinnules on the lower side larger than the

Cheilanthes—*continued.*

others, ovate, bluntish, cut down to the rachis into oblong, blunt, nearly entire segments. *sori* small, placed all round the edge of the segments. Cape of Good Hope. (H. S. F. ii. 77.)

FIG. 420. CHEILANTHES CLEVELANDI.

C. Clevelandi (Cleveland's).* *sti.* tufted, erect, scaly. *fronds* 4in. to 12in. long, ovate-lanceolate, tri- or (rarely) quadripinnate; ultimate divisions of pinnæ nearly round, sub-lenticular, small, deep green above, covered with fine white scales beneath. North-west America. Hardy, or nearly so. See Fig. 420.

C. Eatoni (Eaton's).* *sti.* tufted, 3in. to 6in. long, wiry, densely scaly. *fronds* 3in. to 8in. long, 1¼in. to 2in. broad, ovate-lanceolate, tripinnatifid; lower pinnules distant, alternate or opposite, deltoid; pinnules linear-oblong, pinnatifid; upper surface densely clothed with white woolly tomentum, lower also densely matted, the margin of the segments incurved. Greenhouse. Western United States, &c.

C. elegans (elegant). A synonym of *C. myriophylla elegans.*

C. farinosa (mealy).* *sti.* densely tufted, 3in. to 6in. long. *fronds* 3in. to 12in. long, 3in. to 6in. broad, lanceolate or deltoid, bi-tripinnatifid; pinnæ numerous, opposite, lower ones mostly largest; lowest pinnules longer than the others, deeply sinuato-pinnatifid; under surface densely coated with pure white powder. *sori* small, brown, placed in a continuous line along the edges. Tropics of both hemispheres. Greenhouse species. (B. M. 4765.)

C. Fendleri (Fendler's).* *sti.* scattered, 2in. to 4in. long, wiry. *fronds* 3in. to 4in. long, 1in. to 1½in. broad, ovate-lanceolate, tripinnatifid; pinnæ lanceolate-deltoid, about ⅜in. long; pinnules linear-oblong, cut into small oblong segments; rachis densely scaly. *sori* copious, marginal. Rocky Mountains. Greenhouse species. (H. S. F. ii., 107.)

C. flexuosa (flexuose). *sti.* tufted, 2in. to 4in. long. *fronds* 4in. to 6in. long, deltoid, tripinnate; pinnæ and pinnules lanceolate, short-stalked, lowest largest; segments flattish, ovate-oblong, blunt, sessile, one to one and a half lines broad. *sori* six to eight to largest segment. Tropical America. Stove species.

C. fragrans (fragrant).* *sti.* cæspitose, wiry, 1in. to 3in. long, densely scaly. *fronds* 2in. to 3in. long, about 1in. broad, ovate-acuminate, bi- or tripinnatifid; pinnæ opposite, deltoid, cut down to the rachis below into several sinuato-pinnatifid linear-oblong lobes. *sori* small, copious. South Europe, &c., 1778. Half-hardy. SYNS. *C. odora* and *C. suaveolens.*

C. frigida (frigid). A synonym of *C. lendigera.*

C. gracilis (slender). A synonym of *C. lanuginosa.*

C. gracillima (most slender).* *sti.* densely tufted, 2in. to 6in. long, wiry, slender. *fronds* 3in. to 4in. long, 1in. broad, narrowly ovate-lanceolate, bi- or tripinnatifid; lower pinnæ opposite, lanceolate-deltoid, cut down to the rachis into several linear-oblong segments on each side; lower surface densely matted with pale brown woolly tomentum; margin of the segments much incurved. *sori* copious, marginal. California, &c. Greenhouse or frame species.

C. hirta (hairy). *sti.* tufted, 2in. to 4in. long, strong, erect, densely hairy. *fronds* 4in. to 12in. long, 2in. to 5in. broad, ovate-lanceolate, tripinnatifid; pinnæ opposite, spreading from the main rachis at right angles, lanceolate, and cut down to the rachis into numerous oblong pinnules, which are about ¼in. long; margin of the segments much incurved. *sori* copious. Cape of Good Hope, 1806. Greenhouse species. (H. S. F. ii., 101 b.)

Cheilanthes—*continued.*

C. lanuginosa (woolly).* *sti.* densely tufted, erect, wiry. *fronds* 4in. to 8in. long, 1in. to 1½in. broad, ovate-lanceolate, bipinnatifid; pinnæ in opposite pairs, the lower ones deltoid; pinnules linear-oblong, with numerous small roundish segments; lower surface densely tomentose; margin of the segments much incurved. North America. Hardy. SYN. *C. gracilis.*

C. lendigera (maggot-bearing).* *sti.* 3in. to 12in. long, strong, erect, tomentose. *fronds* 4in. to 12in. long, 2in. to 4in. broad, lanceolate, tri- or quadripinnatifid; pinnæ numerous, the lowest opposite, lanceolate; pinnules numerous, linear oblong, cut down to the rachis into numerous distinct convex segments, half a line or less each way. *sori* sub-continuous. Mexico, &c. Greenhouse species. SYN. *C. frigida.* (H. S. F. ii. 104.)

C. Lindheimeri (Lindheimer's).* *sti.* scattered, 3in. to 6in. long, wiry. *fronds* 3in. to 6in. long, 1½in. to 2in. broad, ovate-lanceolate, tripinnatifid; pinnæ numerous, contiguous, the lowest about 1in. long, ⅜in. broad; pinnules numerous, linear-oblong; rachis densely scaly above; upper surface woolly, lower densely scaly; margin of the segments much incurved. *sori* copious, marginal. Texas and New Mexico. Greenhouse species. (H. S. F. ii., 107.)

C. microphylla (small-leaved).* *sti.* 2in. to 6in. long, wiry. *fronds* 3in. to 9in. long, 2in. to 3in. broad, ovate-lanceolate, bi- or tripinnatifid; pinnæ in numerous nearly opposite pairs, the lowest 1in. to 2in. long; pinnules linear-oblong, entire or sub-deltoid, and cut down to the rachis below. *sori* roundish or elongated. Tropical America. Greenhouse species. There are numerous varieties and forms of this, one of which is *C. micromera*, with numerous close-spreading pinnæ; pinnules ovate-oblong, entire or nearly so. (H. S. F. ii. 99.)

C. multifida (much-cut). *sti.* tufted, 3in. to 9in. long, strong, erect. *fronds* 3in. to 12in. long, 2in. to 8in. broad, ovate-lanceolate or deltoid, tri- or quadripinnatifid; lower pinnules opposite, remote, deltoid, 2in. to 6in. long; ultimate divisions linear-oblong, deeply lobed, and the margin in the fertile plant much recurved. *sori* terminal on the lobes, small, roundish, slightly confluent. Cape of Good Hope, &c. Greenhouse species. (H. G. F. 39.)

C. myriophylla (myriad-leaved). *sti.* densely tufted, wiry, erect, clothed with pale, woolly tomentum. *fronds* 4in. to 6in. long, and 1½in. to 2in. broad, ovate-lanceolate in outline, tri- or quadri-pinnatifid; pinnæ lanceolate-deltoid, with linear-oblong pinnules on both sides; ultimate segments very small, roundish, and bead-like, of a bright green colour above, densely matted beneath, with a sub-coriaceous texture. Tropical and warm temperate America. Stove or greenhouse species. The variety *elegans* (SYN. *C. elegans*) has obovate-pyriform segments, usually tapering into a distinct stalk. Found in the same localities.

C. mysurensis (Mysuran).* *sti.* densely tufted, very short, wiry. *fronds* 3in. to 12in. long, 1½in. to 3in. broad, ovate-lanceolate, tripinnatifid; pinnæ numerous, the lowest opposite, about 1in. long, lanceolate-deltoid, cut down to the rachis into numerous linear-oblong, pinnatifid pinnules. *sori* small, roundish, distinct, or slightly confluent. Tropical Hindostan. Greenhouse species. (H. S. F. ii. 100.) *C. fragilis* is said to be very doubtfully distinct from the foregoing species, but it is a larger plant.

C. odora (sweet). A synonym of *C. fragrans.*

C. Preissiana (Preiss's). A synonym of *C. Sieberi.*

C. pteroides (Pteris-like). *sti.* 6in. to 12in. long, strong, erect. *fronds* 12in. to 18in. long, 6in. to 9in. broad, deltoid, tripinnate; upper part simply pinnate; lower with several opposite pairs of wiry erecto-patent branches, growing gradually larger downwards; segments oblong, entire. *sori* small, roundish, distinct but contiguous. Cape of Good Hope, &c., 1775. Greenhouse species. (H. S. F. ii. 101.)

C. radiata (rayed).* *sti.* tufted, 12in. to 18in. long, strong, erect, wiry; pinnæ six to nine, all radiating from a common centre, like the spokes of a wheel, with a whorl of bract-like segments at the axis, the longest 6in. to 9in. long, about 1in. broad; pinnules numerous, close, ¼in. long, unequal-sided, truncate at base. *sori* small, very numerous, placed along both margins of the entire pinnules. Tropical America. Greenhouse species. (H. S. F. ii. 91.)

C. rufa (reddish).* *sti.* tufted, 1in. to 2in. long, densely tomentose. *fronds* 6in. to 9in. long, 2in. to 3in. broad, ovate-lanceolate, bi-pinnatifid; pinnæ opposite, the lower ones with 1in. to 2in. between them, oblong; pinnules on the lower side the largest, ¼in. to ½in. long, linear-oblong; under surface coated with white powder. *sori* copious, marginal, roundish, small. North of Hindostan. Greenhouse species. (H. S. F. ii. 99.)

C. Sieberi (Sieber's).* *sti.* densely tufted, 3in. to 6in. long, wiry. *fronds* 3in. to 6in. long, 1in. to 1½in. broad, oblong-acuminate, tripinnatifid; pinnæ in pairs, the lowest often distant, deltoid, with several opposite, oblong-deltoid pinnules, which are cut down to the rachis in the lower part; involucre small, narrow, pale brown, roundish, and separate or combined. Australia, &c. Greenhouse species. SYN. *C. Preissiana.* (H. S. F. ii. 97.)

C. suaveolens (sweet-smelling). A synonym of *C. fragrans.*

C. tenuifolia (slender-leaved). *sti.* 4in. to 6in. long, wiry, flexuose. *fronds* 4in. to 8in. long, 3in. to 4in. broad, deltoid, tripinnatifid; pinnæ in numerous opposite pairs, deltoid; pinnules on the lower side the largest, the lowest 1in. long, cut into sinuato-pinnatifid segments. *sori* roundish or sub-continuous. Tropics, southern hemisphere. Greenhouse species. (H. S. F. ii. 97.)

Cheilanthes—*continued.*

C. tomentosa (tomentose).* *sti.* tufted, 4in. to 6in. long, strong, erect, densely tomentose. *fronds* 6in. to 12in. long, 2in. to 3in. broad, ovate-lanceolate, tripinnatifid; lower pinnules distant, opposite, 1in. to 1¼in. long, deltoid; pinnules linear-oblong, cut into numerous small oblong segments; rachis densely woolly; upper surface grey-green, pubescent; lower densely matted. Mexico. Greenhouse species. SYN. *C. Bradburii.* (H. S. F. ii. 109 b.)

C. vestita (clothed).* *sti.* tufted, 2in. to 4in. long, wiry, slightly tomentose. *fronds* 4in. to 8in. long, 1½in. to 2in. broad, ovate-lanceolate, tripinnatifid; lower pinnæ distant, opposite, about ½in. long, cut down to the rachis into several oblong pinnules on each side. *sori* copious. North America, 1812. Nearly hardy.

C. viscosa (clammy).* *sti.* tufted, 4in. to 6in. long, strong, erect, pubescent. *fronds* 4in. to 6in. each way, deltoid, tri- or quadripinnatifid; pinnæ in pairs, the lowest much the largest; pinnules of the lower side larger than the others, lanceolate, with narrow linear-oblong segments, which are again cut down to the rachis. *sori* more or less confluent. New Mexico, &c., 1841. Stove or greenhouse species. (H. S. F. ii. 93.)

C. Wrightii (Wright's).* *sti.* 2in. to 4in. long, strong, wiry. *fronds* 2in. to 3in. long, 1in. to 1½in. broad, ovate-lanceolate, tripinnatifid; pinnæ in several opposite pairs, the lowest about 1in. long; pinnules cut about half-way down. *sori* copious, the margin of the fertile fronds much incurved. Texas. Greenhouse species. (H. S. F. ii. 90.)

CHEIMATOBIA BRUMATA. *See* **Winter Moth.**

FIG. 421. FLOWERING BRANCH OF CHEIRANTHUS CHEIRI.

CHEIRANTHUS (from *Cheiri* or *Kheyry*, the Arabic name of a plant with very red sweet-scented flowers, and *anthos*, a flower; or perhaps from *cheir*, the hand, and *anthos*, a flower—hand-flower). Wallflower. ORD. *Cruciferæ.* Biennial, perennial, or suffruticose herbs. Racemes elongated; pedicels bractless, filiform; siliqua long and narrow. Leaves oblong or lanceolate, entire or toothed. The hardy shrubby varieties of the common sort should be increased by young cuttings, which will soon root outside, if covered with a hand glass. The half-hardy kinds will thrive well in a light rich soil; young cuttings will strike freely under a hand glass, in a cold frame, and may be kept there, or in a cool house, through the winter. The herbaceous perennials may also be increased by young cuttings

Cheiranthus—*continued.*

or seeds. The biennial and annual kinds are propagated by seeds, sown in the open border, from March to July. All the species thrive well if planted on the rockwork, and even the tenderer sorts, thus treated, will survive mild winters. The common Wallflowers—varieties of *C. Cheiri*—will thrive almost anywhere.

C. asper (rough). *fl.* yellow, rather large, in dense corymbs. June. *l.* linear-lanceolate, more or less toothed or entire, tapering much to the base, and are, as well as the stem, covered with close-pressed, two-parted hairs. Stem branched. *h.* 1ft. California, &c., 1826. Half-hardy. SYN. *C. capitatus.*

C. capitatus (headed). A synonym of *C. asper.*

C. Cheiri (Cheiri).* Common Wallflower. *fl.* greatly varying in size and colour, but all fragrant. Early spring and summer. *l.* lanceolate, quite entire, covered with two-parted pressed hairs, or smooth. *h.* 1ft. to 2ft. Europe, 1573. See Fig. 421. Of this universally grown and admired spring perennial there are a great number of varieties, both double and single. The Double German strains are particularly good; their habit is very dwarf and compact. The following sorts are worth growing. *Double varieties*: Yellow, light brown, dark brown. *Single varieties*: BLOOD RED, HARBINGER, BELVOIR CASTLE, and GOLDEN TOM THUMB.

FIG. 422. FLOWERING BRANCHES OF CHEIRANTHUS CHEIRI FLORE-PLENO.

C. C. flore-pleno (double-flowered). *fl.* varying considerably in colour, from clear yellow to very dark red. Seeds of a good strain will yield a large proportion of double flowers. See Fig. 422.

C. Marshalli (Marshall's).* *fl.* deep clear orange, nearly ¾in. across, very freely produced. Spring. *l.*, lower ones more or less spathulate, crowded; upper ones narrowly lanceolate. *h.* 1ft. to 1½ft. Supposed hybrid.

C. Menziesii (Menzies'). *fl.* bright purple. Spring. *l.* radical, oblong-lanceolate, 2in. to 4in. long, densely covered with a short stellate pubescence. *h.* 6in. to 8in. California. A half-hardy perennial, with a thick, long, persistent branching root-stock.

C. mutabilis (changing).* *fl.* at first cream-coloured, afterwards becoming purple, or striped. March. *l.* linear, lanceolate, pointed, finely serrated, somewhat downy, with two-parted hairs. Stem frutescent, branched. *h.* 2ft. to 3ft. Madeira, 1777. Half-hardy shrub. (B. M. 195.)

C. ochroleucus. *See* **Erysimum ochroleucum.**

C. scoparius (broom). *fl.* white, then purple. May. *l.* linear-lanceolate, acuminated, entire, rather pubescent, with appressed two-parted hairs. Stems shrubby, branched. *h.* 2ft. to 3ft. Teneriffe, 1812. Half-hardy. (B. R. 219.)

C. semperflorens (ever-flowering). *fl.* yellow or white; pedicels one-half shorter than the calyx. January to December. *l.* linear-lanceolate, quite entire, roughish. Stem shrubby, branched. *h.* 1ft. to 2ft. Marocco, 1815. Half-hardy.

CHEIROSTEMON (from *cheir*, the hand, and *stemon*, a stamen; the stamens are five in number, the filaments are united at the base, and are recurved at their top, which gives them the appearance of a hand). Hand-plant. ORD. *Malvaceæ.* A fine cool-house tree, succeeding well in a

Cheirostemon—*continued.*

mixture of turfy loam and peat, or any light rich soil. Cuttings of rather firm shoots will root in sandy peat, if placed under a hand glass, in heat.

C. platanoides (Plane-tree-like). *fl.* solitary, hoary-tomentose; petals absent; calyx somewhat campanulate, furnished with three bracteoles on the outside at the base. *l.* five and six-lobed, palmate-nerved. *h.* 60ft. Mexico, 1820. (B. M. 5135.)

CHEIROSTYLIS (from *cheir*, the hand, and *stylos*, a column; the projecting column is ridged on the back, having somewhat the appearance of the fingers of a hand). ORD. *Orchideæ*. A genus of somewhat interesting, but inconspicuous, stove Orchids, in general aspect like a small *Goodyera*, but differing from that genus in several respects. They require damp heat, and a mixture of three parts chopped sphagnum and one part well-decayed leaf mould. Increased by the creeping stems.

C. marmorata (marble-leaved).* *fl.* white, with a reddish calyx; raceme dark purple, long, downy. September. *l.* deep reddish olive-green, with a velvety surface, traversed by fine golden veins, which disappear to a great extent when the leaves become old. *h.* 3in. India, 1849. (F. d. S. 4, 370.)

C. parvifolia (small-leaved). *fl.* white. September. *h* 3in. Ceylon, 1837.

CHELIDONIUM (from *Chelidonion*, the Greek name used by Dioscorides, from *chelidon*, a swallow; it is said that the plant flowers at the time of the arrival of swallows, and dries up at their departure). Celandine; Swallow-wort. ORD. *Papaveraceæ*. The only species is a perennial herb, abounding in an acrid saffron-coloured juice. It forms an excellent subject for naturalising in shrubberies, and in the wild garden. Increased by seeds, or by division of the roots. In a wild state, it is distributed over the temperate parts of Europe and Asia.

C. japonicum. *See* **Stylophorum japonicum.**

C. majus (large). *fl.* yellow, three to six together in a loose umbel; penduncles hairy, with a roundish bract at the base. Spring and summer. *l.* pinnate, thin; leaflets roundish, coarsely toothed. *h.* 1ft. to 2ft. Great Britain. (Sy. En. B. 67.) There is a pretty variety (*laciniata*) with segments of the leaves cut into many linear, acute, laciniated lobes, and the petals also cut; also a double-flowered form.

CHELONANTHERA (in part). A synonym of **Pholidota** (which *see*).

FIG. 423. CHELONE LYONI, showing Habit, and Side View (1) and Front View (2) of Single Flower.

CHELONE (from *chelone*, a tortoise; the back of the upper lip of the corolla is compared to a tortoise). Turtle-head. ORD. *Scrophularineæ*. Very handsome herbaceous

Chelone—*continued.*

plants, allied to *Pentstemon*. Flowers imbricately spiked, terminal; corolla ringent, ventricose; lower lip internally bearded; sterile stamens shorter than the others. Seeds winged. Leaves opposite. They are of very easy culture in almost any ordinary garden soil, although a rich, moderately light loam is the most satisfactory. Propagation is readily effected by dividing the plants, about August or September, depending upon the flowering; if this operation be performed in spring, the results are not always so satisfactory. They may also be increased by means of seeds and young cuttings, inserted in sandy soil, in a cold frame.

C. atropurpurea (dark purple). A synonym of *Pentstemon campanulatus*.

C. barbata. *See* **Pentstemon barbatus.**

C. glabra (smooth). A glabrous variety of *C. obliqua*.

C. Lyoni (Lyon's).* *fl.* purple; spikes terminal, with the flowers clustered. July to September. *l.* petiolate, cordate-ovate, serrated. Plant glabrous, branched. *h.* 3ft. to 4ft. North Carolina, 1812. SYN. *C. major*. See Fig. 423. (B. M. 1864.)

C. major (large). A synonym of *C. Lyoni*.

C. nemorosa (wood).* *fl.*, corolla rosy-purple, ventricose; anthers woolly; peduncles three-flowered, downy. July. *l.* ovate, acuminated, serrated. Plant branched, glabrous. *h.* 1ft. North-west America, 1827. (B. R. 1211.)

C. obliqua (oblique).* *fl.* purple, in close, terminal spikes. Summer. *l.* petiolate, oblique, lanceolate, unequally serrated, very smooth. *h.* 2ft. to 3ft. Less vigorous than *C. Lyoni*. North America, 1752. SYN. *C. purpurea*. (B. R. 175.) The variety *alba* produces white flowers, and is very showy.

C. purpurea (purple). A synonym of *C. obliqua*.

CHENOPODIACEÆ. An order of herbs or sub-shrubs. Flowers inconspicuous; perianth deeply divided. Leaves alternate, sometimes opposite, exstipulate. This order includes *Atriplex*, *Beta*, *Chenopodium*, and *Spinacia*.

CHENOPODIUM (from *chen*, a goose, and *pous*, a foot; in allusion to the shape of the leaves). ORD. *Chenopodiaceæ*. An extensive genus of herbaceous or sub-shrubby plants, of little ornamental beauty. They are more or less employed as pot herbs, particularly the species commonly known as "Good King Henry" (*C. Bonus-Henricus*). Calyx of three to five connate sepals, inferior, persistent and unaltered, closing upon, and often wholly enveloping, the fruit; corolla none. Seeds solitary, lenticular.

The Mercury Goose-foot, or Good King Henry, has, in some parts of England, especially in Lincolnshire, long been esteemed as a substitute for Asparagus. The following method of culture is recommended: The ground should be rich, dry, and deeply trenched. Plants should be put in, about April, 9in. asunder each way; or seeds sown

FIG. 424. FLOWERING BRANCH OF CHENOPODIUM AMBROSIOIDES.

in drills 9in. apart, afterwards hoeing out to 9in. from plant to plant. As soon as they have ripened off, a dressing of leaf soil, about 4in. or 5in. in thickness, should be applied. In the spring of the first year, only a small quantity should be cut, as the plants would be too greatly weakened; but each subsequent year, full crops will be

Chenopodium—*continued.*

had. During the season of vigorous growth, the plants are greatly improved by watering with liquid manure. Besides the young shoots forming a substitute for Asparagus, the leaves can be used when young instead of Spinach. These are rather large, considering the size of the plants. The latter must not, however, be too greatly denuded of foliage, or they will soon become worthless. A contemporary writer says that, from a south border, cutting generally commences early in April, and continues until the end of June. When properly grown, the young shoots should be almost as thick as the little finger; and, in gathering, it should be cut under the ground, somewhat similar to Asparagus.

C. ambrosioides (Ambrosia-like). Mexican Tea. *fl.* greenish. *l.* slightly petioled, oblong or lanceolate, repand-toothed, or nearly entire, the upper tapering to both ends; spikes densely flowered, leafy or almost leafless. A native of tropical America, but now naturalised in nearly all temperate climates. Annual. See Fig. 424.

C. atriplicis (Atriplex-like). *fl.* bright reddish-purple, disposed in clustered heads. *l.* numerous, petiolate, nearly spathulate. Stem angular, erect, slightly branched, reddish; young shoots and leaves covered with a fine rose-violet powder. *h.* 3ft. China. A vigorous half-hardy annual, well adapted for planting on grass-plats, or grouping with other plants in pleasure-grounds. SYN. *C. purpurascens.*

C. Bonus-Henricus.* All-good; Good King Henry. *fl.*, corolla quite campanulate; spikes compound, terminal, and axillary, erect, leafless. August. *l.* triangular, arrow-shaped, mostly entire, large, dark green. Stems striated. *h.* 1ft. Britain. Perennial. (Sy. En. B. 1199.)

C. purpurascens (purplish). A synonym of *C. atriplicis.*

CHERIMOYER. *See* **Anona Cherimolia.**

CHERRY (*Cerasus*). There are two species of *Cerasus* found wild in Britain; others are natives of Southern Europe. The Morello, Duke, and Kentish varieties are supposed to have been derived from the wild, or dwarf, Cherry (*Cerasus Caproniana*), and the Geans, Hearts, and Bigarreaus from the tall wild Gean (*C. Avium*). They have been in cultivation from an early period, and whether the origin of all the varieties now cultivated is confined to these species, or in part to others, is not definitely known. The Cherry is the earliest to ripen of any hardy fruit (at least, the early varieties are), and, being of a very refreshing character, is much appreciated. Those unfit for dessert on account of their acidity are employed for various purposes in cooking, and the Morellos are much used for preserving or bottling in brandy. Fig. 425 represents a corymb of Cherry, with fully expanded flowers.

FIG. 425. CORYMB OF CHERRY.

Propagation. This is effected by budding or grafting, and, to obtain new varieties, by seeds. The stock most generally used for grafting is the wild Gean, obtained by sowing seeds in nursery rows, planting them out at the

Cherry—*continued.*

end of the second year, and growing on until large enough for use. The Mahaleb stock (*C. Mahaleb*) is much used in France, but it is not suited in some soils in England. Being dwarf-growing, it is useful for dwarf trees, and for Morello and other small-leaved sorts. The general plan is to bud in the summer, when the bark runs freely, choosing cloudy weather for the purpose, and carefully selecting wood-buds. If the buds fail to unite, or do not afterwards grow, the stocks may be grafted the following spring. Selection of scions for grafting is an important matter. In some varieties, the whole length of the shoot will contain only blossom-buds, except the one at the point. In such cases, the latter must not be cut off. Scions should be cut off early in the year, and laid in the ground, until the stocks have begun to grow, which will generally be in March. If prepared in this way, there is a much greater chance of success.

Soil and Situation. The soil must not be too heavy; neither will a very light one, with dry subsoil, be suitable. A good deep loam, moderately rich and well drained, will suit Cherries admirably. Rank manure should not be mixed in the soil when preparing for planting; but well-decomposed leaf soil, burnt refuse, mortar rubbish, &c., will be of great assistance to keep the compost open if it is at all heavy. If Cherries are planted against walls, the borders should be formed to slope from the wall, in order to ensure drainage. For Cherry orchards, the site selected should, if possible, be somewhat undulated, for the same reason. Cultivation in orchards is not practised in all districts, but in some counties large quantities are grown in this way, notably in Kent, Hertfordshire, and Buckinghamshire. The position given to Cherry-trees in the majority of gardens, and that most convenient for protection, is a wall, varying in aspect with the sort grown. The earliest should be planted against a south wall; the mid-season and main crop varieties will be best suited with a western aspect; and the Morello and Kentish Cherries will do well on a wall facing north or north-west. Various systems of training are adopted for the Cherry, and the one selected must depend on the position and the space to be occupied. Standards are the most suitable for orchards, and should be planted from 20ft. to 30ft. apart. For covering high walls, an arrangement of fan-trained trees on tall stocks, with alternate dwarf trees, trained in the same way, is probably the best method. Where a large collection is desired, the trees may be grown in a limited space on either of the cordon systems; but the quantity of each sort will be somewhat limited if this method is adopted. Horizontal training is also practised, about 1ft. being allowed between the branches for the Bigarreau and other strong-growing kinds, and about 9in. for those of the May Duke type.

Protection. The Cherry is an early-flowering tree, and is, consequently, very subject to destruction by spring frosts. Trees on walls may be protected by light shading or double nets in frosty weather, but coverings that exclude light are injurious. Protection from birds, as soon as the fruit begins to colour, is very necessary with all the varieties of Cherries, or the whole crop may be lost. Netting the trees is the only effectual remedy. The net should be fastened under the coping, without leaving any open spaces, and be kept from the trees by means of stakes or framework, carefully fitting it at the bottom. If any spaces are left open, the birds are sure to effect an entrance.

Pruning. Very little pruning is necessary with standard Cherry-trees, beyond keeping the heads in shape and evenly balanced. Most of the varieties fruit on spurs, and should have the growths removed in summer to about 3in. long, thereby admitting light to the fruit, and enabling the plant to form its flower-buds for the following year. If these growths are properly shortened in summer, about the time the stoning process is completed, and all superfluous shoots removed, very little pruning will be necessary in winter.

Cherry—*continued.*

The Morello Cherry requires quite different treatment, in this respect, to any others, as the fruit is produced from the wood of the previous year. The weakest shoots, and some of the old wood, must be cut away, to prevent overcrowding, the strongest only being retained, and nailed in at a distance of about 3in. apart. The fruit may be allowed to hang on the trees of the Morello, if protected, until very late in the season. Thinning of the wood, and nailing in, should be done in spring, before the buds swell, or many of the latter will be broken off. Superfluous shoots should be removed during the summer, to allow the others to ripen, and to obviate the necessity of cutting the trees hard in winter.

Cultivation under Glass. Cherries may be successfully cultivated under glass, provided care be taken not to force them too much in the early stages of growth. They may be grown in pots, if extra attention is given to watering, or be planted out. Cordon trees might with advantage be introduced into the front or some other portion of Peach houses where early forcing is not practised, some of the early varieties being chosen for the purpose. It is important that the trees should not suffer for want of water, or, on the other hand, be allowed to get soddened. A temperature of 40deg. to 45deg. is sufficient to start with, air being admitted on all favourable opportunities, especially when the trees are in flower. Cold draughts must, however, be avoided. Ripe fruit may be obtained in April, if the trees are started in January, and very gently forced until after the stoning period. The fruits are liable to drop in large numbers before stoning, should the house be over-heated, or the trees kept in too close an atmosphere, consequently such conditions must be avoided. Large numbers often fall from outside trees, on account of frost or continued low temperature. Trees grown under glass should be fully exposed to the air, so soon as the fruit is gathered, in order to thoroughly ripen the wood. If planted in a house, the sashes should be left open; and if grown in pots, the trees may be removed, and plunged in the open. Watering must still be carefully attended to during the whole of the summer, to mature and prepare the trees for the next year's crop.

Cherry-trees are very liable to gumming at any part of the branches where pruning or other injury has been caused to the bark. It is not considered injurious except in bad cases. **Black Fly** (which *see*) is one of the most troublesome insects the trees are subject to.

Sorts. Appended are lists of the principal kinds in cultivation:

BIGARREAUS. Of these, the following are the most desirable:

Black Bohemian. Flesh and skin jet-black; richly flavoured and delicious.

Büttner's Black Heart. Larger than the common Black Heart, with even a more pleasant flavour.

Büttner's Yellow. Medium size, yellow, becoming amber when fully ripe; sweet and rich.

Downton. Skin pale yellow, spotted with red dots, flesh yellowish; one of the richest and most delicious.

Elton. Skin pale yellow on the shaded side, mottled with red next the sun; flesh whitish, very rich. The tree is a good bearer, and the variety is considered by many the best that can be grown.

Florence. Fruit large, pale amber, mottled with red; flesh firm, juicy, and sweet. This variety requires a wall with west or south-west aspect.

Frogmore Early. Of a deep red next the sun; juicy and rich. As early as May Duke.

Gascoigne's Heart, or **Hertfordshire Bleeding Heart.** One of the finest and most popular cherries.

Governor Wood. Fruit light red, and of the best quality. A very fine and prolific American sort.

Graffion, or **Ambrée.** White, marbled with red; flesh yellow, and highly flavoured.

Jaboulay. A large, rich, early red cherry, with a firm, highly-flavoured flesh.

Late Black. Very large and late; valuable for ripening in August.

Cherry—*continued.*

Monstrous Heart. Skin yellowish, changing to red; flesh purple, firm, and juicy; very large.

Napoleon. One of the largest and best of heart-shaped cherries, not unlike the Elton, but larger and earlier.

Tradescant's Black Heart. Dark red, changing to dark purple or black; flesh firm and sweet; very large and uneven.

GEANS. This class comprises the following sorts:

Adams's Crown. Pale red, mottled with yellow; flesh almond-white, full of juice, and richly flavoured.

Belle de Orleans. A roundish, heart-shaped variety, with a yellowish skin; flesh richly flavoured.

Black Eagle. A medium-sized delicious cherry, ripening in July.

Early Amber. Of good size, heart-shaped, with a pale amber colour; flesh yellow, sweet, juicy.

Early Purple Guigne. Fruit rather flattened on one side; dark, rich, and tender; very large and early.

Early Rivers. A large black early cherry, a seedling from the Purple Guigne; good and prolific.

Hogg's Red Gean. A beautiful red cherry, freckled with yellow; flesh a pale orange; juicy, tender, and sweet.

Late Amber Gean. Of medium size; skin very thin and semi-transparent; delicately and richly flavoured.

Late Purple Gean. One of the finest late sorts, ripening in the end of July.

Rose de Lyons, or **Early Lyons.** Light yellow in colour, and of a delicious flavour; one of the earliest and best cherries grown.

Waterloo. A noble-looking cherry, depressed at the end, and flattened on one side; black, covered with small dots; tender and juicy.

Werder's Early Black. Very large, with a deep suture on one side; deep purple colour, and a rich purple flesh, of delicious flavour.

DUKES, or MAY DUKES. These, though not so sweet as the two classes already named, are nevertheless fully as popular, and equally useful. For all culinary purposes, this class of Cherries, from their sharp sub-acid qualities, are preferred to either the Bigarreau or Gean.

Archduke. Of excellent quality, almost jet-black when ripe; flesh deep red, tender, and juicy; ripens in July. This is the largest of the Dukes.

Belle Magnifique. A very large, clear, bright red cherry, with yellow flesh, and a sharpish sub-acid flavour.

Büttner's October. Light red flesh, and a pleasant, sharpish flavour. A very useful, late, and excellent culinary variety.

Carnation. Flesh tender, rather acid. A valuable reddish-yellow cherry, hanging till the end of August or middle of September.

Duchesse de Palinau. Very large, brilliant red, becoming darker as it ripens; flesh tender and juicy, richly coloured, and briskly acid.

Imperatrice Eugenie. An early sort, with all the good qualities of the Duke family; ripening early in June.

Late Duke. A valuable late variety, ripening in August.

May Duke. Flesh red, tender, juicy, and pleasantly sub-acid; ripening almost black. Probably more extensively grown than any other.

Nouvelle Royale. A hybrid between the Dukes and the Kentish, and retains many qualities of both; larger and more uneven than any of the Dukes.

Reine Hortense. Very large, fine, semi-transparent, bright red, with yellow flesh, and brisk sub-acid flavour.

Royal Duke. Flesh reddish and tender; very rich. A handsome red cherry, ripening in July.

Transparent. A beautiful sort, revealing the delicate netted nature of the flesh, which is melting and tender.

MORELLO and KENTISH CHERRIES. In these, we reach a maximum of acidity, and yet this class is one of the most useful of all Cherries.

Kentish, or **Flemish.** These are so nearly alike that they may be classed together, though some growers offer them as distinct varieties. In ordering, it will be best to ask for Kentish Cherries. Fruit red, medium-sized, round, having a rather acid property, which, however, has been held to enhance its value for culinary and preserving purposes. After the fruit is ripe, the stalk adheres so firmly to the stone that they may be withdrawn together without removing much of the pulp.

Morello. A medium-sized round cherry, becoming nearly black when fully ripe. Flesh deep reddish-purple, with a sharp acid flavour. It is largely used for many purposes.

Ostheim. Larger and less acid than the Morello.

Weeping, or **Pendulous Morello.** A very graceful variety, equally fertile, and of the same quality as the common Morello, admirably adapted for forming small standards in the open air.

CHERRY, BARBADOS. *See* **Malpighia glabra.**

CHERRY, CORNELIAN. *See* **Cornus mas.**

CHERRY FLY. *See* **Aphides** and **Black Fly.**

CHERRY, HOTTENTOT. *See* **Cassine Maurocenia.**

CHERRY LAUREL. *See* **Prunus Lauro-cerasus.**

CHERRY PLUM. *See* **Prunus cerasifera.**

CHERRY, WINTER. *See* **Physalis Alkekengi.**

FIG. 426. PLANT OF BULBOUS-ROOTED CHERVIL, IN FLOWER.

CHERVIL, BULBOUS-ROOTED (*Chærophyllum bulbosum*). A hardy biennial, native of Southern Europe (see Fig. 426). This produces roots (see Fig. 427) about

FIG. 427. ROOTS OF BULBOUS CHERVIL

Chervil, Bulbous-rooted—*continued.*

the size of, and somewhat like, Early Horn Carrots. They are yellowish-white, rather sweet, and have the same flavour as the leaves of the Common Chervil. The seeds retain their germinative properties a short time only; consequently, they must either be sown as soon as ripe, or be kept in sand through the winter, out of the reach of frost. If sown late in autumn, the seeds will, in all probability, perish. When stratified during winter, the seeds may be sown in March, either broadcast, or in drills 1ft. apart. The leaves wither about July, when the roots may be lifted and stored, like Potatoes, in a dry shed. The beds must be kept clean in summer by frequent hoeings. Bulbous-rooted Chervil is eaten, when cooked, as a vegetable, but it is not extensively cultivated in this country.

FIG. 428. FLOWERING BRANCH OF HORSE CHESTNUT.

CHERVIL, COMMON or **GARDEN** (*Anthriscus cerefolium*). A hardy annual, native of various parts of Europe. It is grown for the leaves, which are used for culinary purposes and in salads. Seed should be sown occasionally—not too much at a time—either broadcast or in shallow drills. The plants may be thinned out to 8in. apart; and in hot weather, if the ground is light, they should be watered plentifully, or they will soon run to seed. It is advisable to keep a few plants in a cold frame through the winter, as leaves may then be gathered at any time.

Curled Chervil is a variety of the Common, with beautifully curled leaves, which may be employed for garnishing, in addition to its ordinary use. The plants with the best curled leaves should be selected, if some are kept

Chervil, Common or **Garden**—*continued.*

for seed, as they soon deteriorate. A cool north border is the best position for growing Chervil in summer, and a south border is preferable for it in winter.

CHESTNUT, HORSE. This was introduced into Britain about two centuries ago. In foliage, it exhibits a character quite distinct from that of any other hardy tree, and the pyramidal panicles of snowy-white flowers dashed with yellow and pink (see Fig. 428), place it in the first rank amongst deciduous subjects eminently adapted for effective use by the landscape gardener. *See* **Æsculus.**

CHESTNUT, MORETON BAY. *See* **Castanospermum.**

CHESTNUT, SWEET or **SPANISH.** *See* **Castanea sativa.**

CHEVALLIERA. *See* **Æchmea Veitchii.**

CHICA. *See* **Bignonia Chica.**

CHICORY (*Cichorium Intybus*). Succory, or Wild Endive. A hardy perennial, native of Britain. The plants are cultivated much more in France than with us, chiefly for the leaves, which are blanched and used as a salad. A variety called the Coffee Chicory is grown, in some parts of the Continent, for the roots, which are cut up and prepared as a substitute for coffee. Another large-growing variety, called the Witloof, is much cultivated in Belgium; and since it was introduced to this country, it has gained favour as a vegetable, cooked whole, or blanched, and used as the other varieties. The culture is very easy, and the leaves, if grown quickly and well blanched, are wholesome and much esteemed. The plants may be blanched outside in summer, but the salad is best when forced in winter, forming what is called by the French

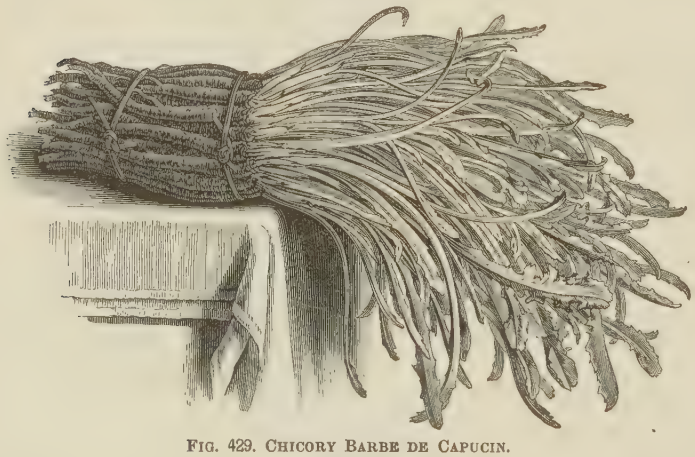


FIG. 429. CHICORY BARBE DE CAPUCIN.

"Barbe de Capucin" (see Fig. 429). The roots grow somewhat like Carrots, and may be taken up in autumn, and forced in the same way as Sea Kale.

Cultivation. An open situation, with rather light and moderately rich soil, should be selected for preparing roots of Chicory for winter forcing. The seed should be sown in drills, 1ft. apart, in May or June, the plants being thinned when up to a distance of 6in. Occasional hoeings between the rows, to keep down weeds, will be all that is necessary during the summer. If summer supplies are required, successional sowings should be made in the same way, about every month, from April to October, and the leaves blanched as soon as they are large enough for use.

Forcing. Chicory may be successfully forced in a temperature of from 55deg. to 60deg. The roots should be placed, about 3in. apart, in boxes or large pots of soil, care being taken to keep the crowns just above the soil. A good watering is necessary to settle the earth around the roots. The pots or boxes should be placed in a

Chicory—*continued.*

warm, dark position. A mushroom house, kept dark and having a suitable temperature, is a very good place. A succession must be kept up, but a second or more crops may be obtained from the same roots, which, however, will not be so strong as the first. The Common Chicory is mostly grown, but the Witloof will succeed under the same treatment. Empty pots or boxes, of the same sizes as those used, should be inverted over the roots to exclude light; or the darkness of a mushroom house may be sufficient in many cases.

CHILI. *See* **Capsicum baccatum.**

CHILOPSIS (from *cheilos*, a lip, and *opsis*, resemblance; on account of the calyx being furnished with a distinct lip). ORD. *Bignoniaceæ.* A greenhouse evergreen shrub, requiring a compost of peat and fibry loam. Cuttings of half-ripened shoots will root in sand, under a bell glass, in a gentle bottom heat.

C. linearis (narrow-leaved). *fl.*, corolla dark purple, with a tubular base, and a dilated companulate throat; lobes oval-roundish, with curled, crenated edges; racemes terminal, short, dense, tomentose. May. *l.* alternate, linear, flat, elongated, 3in. to 5in. long, glabrous, coriaceous, attenuated at both ends. *h.* 10ft. Western North America, 1825. An erect branched shrub.

CHIMAPHILA (from *cheima*, winter, and *phileo*, to love; the plants are green in winter). ORD. *Ericaceæ.* Ornamental evergreen suffruticose plants, with creeping roots. Flowers corymbose; scapes naked. Leaves lanceolate, serrated, verticillate. For culture, *see* **Pyrola.**

C. corymbosa (corymbose).* *fl.* greenish-white, tinged with red, corymbose, pendulous, at length somewhat erect. June. *l.* cuneate-lanceolate, serrated, four to five in a whorl. *h.* 3in. to 6in. Northern hemisphere, 1752. SYN. *Pyrola umbellata.* (B. M. 778.)

C. maculata (spotted).* *fl.* white, pendulous; peduncles downy, bearing a two to three-flowered corymb at the apex. June. *l.* lanceolate, acute, with white bands on the upper surface along the nerve and veins, under surface red; opposite, or four in a whorl. Stem procumbent at base and ascending at apex. North America, 1752. SYN. *Pyrola maculata.* (B. M. 897.)

CHIMNEY BELL-FLOWER. *See* **Campanula pyramidalis.**

CHIMONANTHUS from *cheimon*, the winter, and *anthos*, a flower; in reference to the time of flowering, December and January). ORD. *Calycanthaceæ.* A hardy shrub, with the flowers appearing before the foliage, in the axils of the leaves of the preceding year. Flowers whitish or yellow, purplish inside, very sweet-scented. Bark and leaves without scent. Where sweet-scented flowers are in request during the winter months, the delicious aromatic fragrance of the blossoms of this shrub makes it a general favourite. It is suitable for training against walls and buildings having a south or western aspect. It thrives best in a deep rich sandy soil, and should be kept neatly trained to the wall against which it is planted. It also requires pruning annually, so as to have the principal branches well clothed with young wood, as the blossoms are produced on the previous season's growth. Therefore, when the plants have finished flowering, go over them, and cut in close to the main branches all the young shoots that have flowered, except the leading ones, which must only be shortened to about half their length. The result of this treatment will generally be a good crop of wood, suitable for blossoming the following season. Propagation is best effected by means of layering, in the autumn.

C. fragrans (fragrant).* *fl.* very fragrant. *l.* lanceolate, acuminate, scabrid, slightly hairy beneath. A slender branching shrub. Japan, 1766. SYN. *Calycanthus præcox.* (B. M. 466.) Of the two varieties, *grandiflorus* is by far the best; its flowers are considerably larger and more spreading. (B. R. 451.)

CHINA ASTER. *See* **Aster** and **Callistephus.**

CHINESE CHERRY, DOUBLE. *See* **Cerasus serrulata.**

CHINESE ROSE. *See* **Hibiscus rosa-sinensis.**

CHIOCOCCA (from *chion*, snow, and *kokkos*, a berry; the berries of *C. racemosa* are white, hence it is called Snowberry). Snowberry. ORD. *Rubiaceæ*. Stove evergreen shrubs, generally with a climbing habit. Racemes axillary, opposite, simple, or panicled. Leaves opposite, ovate, or oblong, acute, glabrous. They thrive in a mixture of loam, peat, and sand. Cuttings strike root freely in sand, under a hand glass, in heat.

C. anguifuga (snake-defeating). *fl.* white; racemes panicled. June. *l.* ovate, acuminated; stipules very short, broad, each ending in a short point. *h.* 3ft. to 4ft. Brazil, 1824.

C. racemosa (racemose).* *fl.*, corollas at first white and scentless, but at length becoming yellowish and sweet-scented; racemes many-flowered. February. *l.* ovate, lanceolate, smooth; stipules mucronate. *h.* 4ft. to 6ft. West Indies, 1729.

CHIONANTHUS (from *chion*, snow, and *anthos*, a flower; referring to the snow-white flowers). Fringe-tree. ORD. *Oleaceæ*. Hardy low trees or shrubs, having the branchlets compressed at the top. Flowers in gracefully drooping panicles, from lateral buds. Leaves opposite, simple, entire. This genus differs from *Olea* principally in the segments of the corolla being barely united at the base. *C. virginica* is a fine large ornamental hardy shrub; it requires to be grown in moist soil, either sandy peat or sandy loam, in a sheltered situation. Propagation may be effected by seeds or by layers. Seeds are easily procurable from America, and raised in a cold frame; and, as the plant does not root very readily, this is the best way to increase it. By grafting or budding it on the common Ash, it succeeds very well.

C. retusus (retuse-leaved). *fl.* white, sweet-scented. May. *l.* long-stalked, obovate, retuse, hairy beneath. China, 1850. A low shrub. (L. & P. F. G. iii. 85.)

C. virginica (Virginian).* *fl.* white, pedicellate; racemes terminal. May. *l.* oval, oblong, or obovate-lanceolate, glabrous. *h.* 10ft. to 30ft. North America, 1796. Hardy. The scented flowers come out in May, hanging in long bunches, and, from the corolla being cut into narrow segments, they give it the name of Fringe-tree. There are two or three forms of this species.

CHIONODOXA (from *chion*, snow, and *doxa*, glory; in reference to the plants flowering among the melting snows of their native habitats). ORD. *Liliaceæ*. A small genus containing the three species here described—hardy spring-flowering bulbs. It comes near *Puschkinia*, with which, indeed, it is sometimes confounded. Perianth rotate, campanulate, or funnel-shaped; the equal ligulate, spreading segments in the expanded flower two or three times as long as the tube. *C. Luciliæ* may be grown in pots, and forces well if allowed first to make good roots, by being treated like the Hyacinth. It should be kept very near the glass. Although it does remarkably well out of doors, perfection is best attained by growing it in cold pits or under handlights. All the species succeed admirably in a compost of equal parts peat, loam, and sand, also in leaf mould and sand. Propagated by offsets; or by seeds, which are produced freely, and should be sown in drills outside as soon as ripe. The young bulbs should not be disturbed for three years.

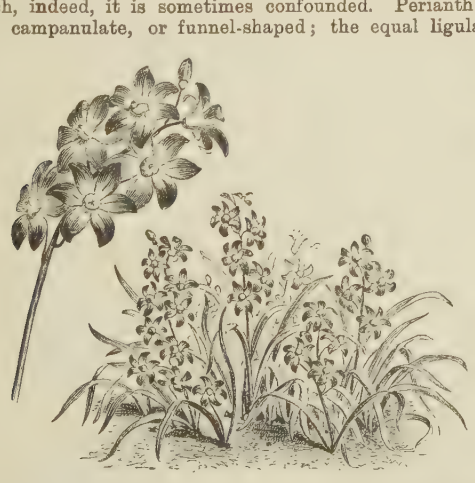


FIG. 430. CHIONODOXA LUCILIÆ, showing Flower-spike and Habit.

Chionodoxa—*continued.*

C. cretica (Cretan). *fl.* white or pale blue; scape slender, 6in. to 10in. high, rarely more than one or two-flowered; perianth somewhat larger than that of *C. nana*, which this species otherwise resembles. Mountains of Crete.

C. Forbesii (Forbes's). A synonym of *C. Luciliæ*.

C. Luciliæ (Lucilia's).* *fl.* intense blue, shading to white in the centre, nearly 1in. across, on slender pedicels; spike usually three to six-flowered, but sometimes nearly twenty flowers are produced. Spring. *l.* few, narrow, erect. *h.* 6in. Asia Minor and Crete, 1877. This is, perhaps, one of the handsomest of spring flowers of recent introduction. SYN. *C. Forbesii*. See Fig. 430. (B. M. 6433.) There is also a white-flowered form.

C. nana (dwarf).* *fl.* white, lilac, ½in. across, in many-flowered umbels. Spring. *l.* linear, shorter than the peduncle. *h.* 4in. Crete, 1879. (B. M. 6453.)

CHIONOGRAPHIS (from *chion*, snow, and *graphis*, a pencil; the flower-spike being like a brush of snow). ORD. *Liliaceæ*. A very remarkable and ornamental herbaceous perennial, requiring slight protection outside in winter. It thrives in a compost of loam, peat, and sand. Propagated, if necessary, by seeds, or by divisions of the roots.

C. japonica (Japanese).* *fl.* pure white, closely packed along a space of 4in. to 5in., spicate; perianth segments variable, four to six, linear, long. Spring. *l.* glabrous, in tufts at the bottom of a long spike, with scattered leafy bracts. *h.* 6in. to 1ft. Japan, 1880. (B. M. 6510.)

CHIRITA (from *Cheryta*, the Hindostanee name for the Gentian plant). ORD. *Gesneraceæ*. Greenhouse or stove evergreen herbaceous plants or shrubs. Corolla tubular, bilabiate; calyx five-cleft, valvate in æstivation. For culture, *see* **Gloxinia.**

C. lilacina (lilac).* *fl.* very beautiful and produced in great abundance; corolla lobes pale blue; tube and throat white; base of tube ornamented with a large yellow blotch at the base. Chiriqui, 1870. This charming plant is very ornamental and effective.

C. Moonii (Moon's).* *fl.* pale purple; corolla large, downy; peduncles axillary, solitary or twin. July. *l.* shortly petiolate, three to four in a whorl, ovate-lanceolate, acutish, obsoletely and glandularly serrated. Branches bluntly tetragonal, suffruticose, villous. *h.* 2ft. Ceylon, 1847. Stove. (B. M. 4405.)

FIG. 431. CHIRITA SINENSIS.

Chirita—*continued.*

C. sinensis (Chinese).* *fl.* lilac; corymbs many-flowered, bibracteate at the base. July. *l.* opposite, elliptic-ovate, crenated; petioles trigonal. Stemless. *h.* 6in. China, 1843. Greenhouse evergreen. See Fig. 431. (B. M. 4284.)

C. zeylanica (Ceylon). *fl.* rich purple, reddish and paler in the tube; large, handsome. *l.* stalked, ovate, acute, entire, covered with rather close-pressed silky-brownish hairs. *h.* 1ft. Ceylon, 1840. Stove. (B. M. 4182.)

CHIRONIA (a classical name, after Chiron, a centaur, son of Phillyra and Saturn; he was famous for his knowledge of music, medicine, and shooting, and taught the use of plants and medicinal herbs). ORD. *Gentianeæ.* Very ornamental small soft-wooded greenhouse perennial herbs or shrubs, all from Southern Africa. Flowers reddish-pink or purple, terminal; corolla salver-shaped, with a narrow tube and a spreading limb, which is longer than the tube. Leaves sessile, opposite, decussate. Stems simple or branched. They thrive in a roughish sandy soil, composed of three-parts peat and one of loam, with a considerable admixture of pure sand. Rather small pots and perfect drainage are matters of importance in their culture. They are easily propagated by cuttings, inserted in sandy soil, and placed in a gentle heat, in spring. Great care must be taken not to over-water, especially in the winter months.

C. baccifera (berry-bearing). *fl.* reddish-pink, terminal, solitary. June. *l.* opposite, decussate, glabrous, linear-lanceolate, sessile, decurrent, with reflexed edges, longer than the internodes. Branches sub-tetragonal. 1759. (B. M. 233.)

C. floribunda (many-flowered).* *fl.* pink; peduncles solitary, one-flowered; petals obovate. June. *l.* linear, or oblong-ovate, acute. *h.* 2ft. 1843. Glabrous, much branched. (P. M. B. xii. 123.)

C. glutinosa (glutinous). *fl.* reddish-pink; corolla large, with an expanded five-parted limb. Summer. *l.* three to five-nerved, ovate-lanceolate. *h.* 2ft. 1843. Plant dark green, smooth. (P. M. B. xv. 245.)

C. jasminoides (Jasmine-like).* *fl.* red or purplish; panicles dichotomous; or flowers terminal, solitary on the tops of the branches. April. *l.* lanceolate, linear. Stem tetragonal. *h.* 1ft. to 2ft. 1812. Plant glabrous. (B. R. 197.)

C. linoides (Flax-like).* *fl.*, corolla red, with ovate-oblong, obtuse segments; peduncles terminal, elongated. July. *l.* linear, erect, fleshy, acute. Stem branched; branches terete, fastigiate. *h.* 1ft. to 2ft. 1787. (B. M. 511.)

CHITONIA. (of Don). *See* **Miconia.**

CHIVES, or **CIVES** (*Allium Schœnoprasum*). A hardy perennial, native of Britain. Chives do well in any garden soil, and may be increased by division of the roots, in spring or autumn. Their chief uses are in soups and salads, being preferred for the latter, as they are much milder than onions, and also more tender. If planted in small bunches, about 9in. apart, and not allowed to seed, they will soon form good-sized clumps. When required for use, each clump may be cut in turn, close to the ground; these will soon grow again. Beds should be replanted at least once in three or four years.

CHLAMYDIA. A synonym of **Phormium.**

CHLIDANTHUS (from *clideios*, delicate, and *anthos*, a flower). ORD. *Amaryllideæ.* A small genus, containing two or three species, confined to South America. They are very ornamental, half-hardy, bulbous plants, the leaves appearing after the flowers. They should be grown in the open air, in a compost of peat, leaf soil, and loam, in equal parts, with some sand, in well-drained pots, until autumn, when they should be removed to a cool part of the greenhouse, and kept dry until the following April; they may then be repotted, watered, and allowed a little more warmth. Propagated freely by offsets, which may be removed, when repotting, in spring.

C. fragrans (fragrant). *fl.* yellow, fragrant, sub-sessile, in few-flowered umbels; perianth with an erect cylindrical tube, widened at the mouth, and a nearly equal somewhat spreading limb of six segments. June and July. *l.* linear-lorate, sheathing at the base. Bulbs truncated. Buenos Ayres, &c., 1820. (B. R. 640.)

CHLOANTHES (from *chloos*, greenish-yellow, and *anthos*, a flower; referring to the greenish flowers). ORD. *Verbenaceæ.* Pretty greenhouse evergreen shrubs, allied to

Chloanthes—*continued.*

Lantana. Flowers solitary, axillary, on short peduncles; corolla tube with a woolly ring on its interior, above the apex of the ovary. Leaves opposite or ternate. They thrive in a compost of fibry loam, and turfy, sandy peat. Cuttings of young shoots root freely in sandy soil, under a hand glass.

C. coccinea (scarlet). *fl.* scarlet, nearly sessile and axillary, but collected into short leafy spikes or heads at or near the summits of the branches. *l.* opposite or in whorls of three, narrow and nearly terete, owing to the revolute margins, obtuse, ¼in. to 1in. long, bullate-rugose. Stems usually clothed with a white cottony wool. *h.* 1ft. to 2ft. Western Australia.

C. glandulosa (glandular). *fl.* yellowish, 1½in. long, axillary; peduncles 3in. to 4in. long. July. *l.* lanceolate or linear-lanceolate, bullate-rugose and decurrent, about 1½in. to 3in. long. *h.* 2ft. New South Wales, 1824.

C. stœchadis (Stœchas-like).* *fl.* greenish-yellow. June to August. Stem erect. *h.* 2ft. New South Wales, 1822.

CHLORA (from *chloros*, pale; alluding to the pale yellow-coloured flowers). Yellow-wort. ORD. *Gentianeæ.* Very pretty little hardy (mostly) annuals. Flowers yellow, terminal, stalked, aggregate or solitary; corolla salver-shaped; tube shorter than the calyx. Leaves opposite, sessile, or perfoliate, entire. They are very easily cultivated, succeeding in pots or borders, in ordinary garden soil; and may be readily propagated from seeds, which should be sown in pots, in a cold frame, in spring.

C. grandiflora (large-flowered).* *fl.* golden-yellow, much larger than those of the kinds described below. *h.* 6in. to 1ft. Corsica and Sardinia. Hardy biennial. (R. G. 469.)

C. imperfoliata (not-perfoliate). *fl.* terminal; corolla deep yellow, six-cleft. June. *l.* sessile, somewhat stem-clasping, ovate, acute. Stems simple, tetragonal. *h.* 1ft. South-western Europe, 1823.

C. perfoliata (perfoliate).* *fl.* golden yellow, in a corymb of two forks, with a pedicellate flower in each fork. July. *l.*, root ones oval, sessile, rosulate, the lower stem ones oval-lanceolate, the rest perfoliate. Stem dichotomous, cylindrical. *h.* 1ft. Europe, in chalky pastures or banks, and limestone and clay soils. (Sy. En. B. 913.)

C. serotina (late-flowering). *fl.* yellow. November. *h.* 1ft. Europe, 1832.

CHLORANTHACEÆ. An order of tropical trees, shrubs, or rarely herbs. Flowers minute, in simple or branched terminal spikes, often articulate. Fruit a small drupe. Leaves opposite, stipulate. Of the few genera, the one best known in this country is *Chloranthus*; the minute flowers of *C. inconspicuus* are said to be used by the Chinese in scenting tea.

CHLORIDE OF LIME is composed of chlorine and lime. When exposed to the air, it parts with a portion of its major constituent, chlorine, and is thus changed to Muriate of Lime, a salt which rapidly absorbs moisture from the air. It has been used with moderate success for quickening the growth of Turnip seed, in the proportion of 1lb. to six gallons of water, soaked for thirty-six hours. Great care should be taken in using it, as it will totally destroy the germinating powers of many seeds. Chloride of Lime is also very valuable as a disinfectant—solution ½lb. to two gallons of water. It is one of the most effectual applications for fixing ammoniacal fumes. In order to bleach skeleton leaves and fruits, the green cellular portions of which have been got rid off by maceration in water for a longer or shorter period, according to the texture and general character of the specimens, immersion in a weak solution of Chloride of Lime for a day or two, is all that is necessary.

CHLORIS (from *chloros*, green). ORD. *Gramineæ.* A genus of very pretty greenhouse or hardy annual grasses. Spikelets one-flowered, awned, singly sessile in two rows on one side of simple spikes, either solitary or digitate at the end of the peduncle, the rachis of the spikelet articulate immediately above the glumes. The few species in cultivation are easily grown in the open air, during the summer months, in a light sandy soil. Propagated by seeds, in a warm situation, during May.

C. barbata (bearded).* *fl.*, spikes 1½in. to 2in. long, many-fascicled;

Chloris—*continued.*

glumes bearded, ciliated; male valves ventricose, bearded. Summer. *l.* flat, with loose sheaths. *h.* 1ft. India, 1777.

C. elegans (elegant). *fl.*, spikes numerous, fascicled; glumes keeled, lanceolate, scabrid on the back. *l.* linear, flat, striated, glabrous on the outer, scabrid on the inner surface. *h.* 1ft. Mexico.

C. radiata (radiate). *fl.*, spikes many-fascicled, nearly erect; florets subulate, smooth. Summer. *l.* narrow. *h.* 6in. West Indies, 1739.

CHLOROGALUM (from *chloros*, green, and *gala*, milk; referring to their green juice). Soap-plant. Ord. *Liliaceæ*. A genus of curious and distinct hardy bulbs, containing three species, all from California. For culture, *see* **Ornithogalum**. The only one in cultivation is *C. pomeridianum*.

C. Leichtlini. *See* **Camassia esculenta Leichtlini.**

C. pomeridianum (afternoon).* *fl.* white, purplish-veined; stems panicled, branched. June. *l.* flaccid, glaucous, with the edges and nerves rough. *h.* 2ft. California, 1819. Syns. *Anthericum pomeridianum* (B. R. 564), *Ornithogalum divaricatum* (B. R. 1842, 28), and *Phalangium pomeridianum*. The bulbs are frequently used in California as a substitute for soap. The flowers only open after mid-day, hence the specific name.

CHLOROPHYLL. The green, resinous, granular colouring matter of plants.

CHLOROPHYTUM (from *chloros*, green, and *phyton*, a plant). Ord. *Liliaceæ*. Greenhouse or stove evergreen perennials, allied to *Anthericum*. They are of easy culture in a rich sandy loam. Propagated by seeds or suckers, or by divisions of the plant in spring. All the species are white-flowered, and are of no special horticultural value. Out of the forty species known to science, the following have been, or are, in cultivation: *affine*, *Bowkerii*, *elatum*, and *falcatum*.

CHLOROSPATHA (from *chloros*, green, and *spathe*, a spathe; green spathe). Ord. *Aroideæ* (*Araceæ*). Allied, and requiring similar culture, to **Xanthosoma** (which *see*).

C. Kolbii (Kolb's). This, the only species, is a spotted-stalked, pedate-leaved, stove tuberous perennial, with elongated, cylindrical, convolute spathes. Chiefly of botanical interest. New Grenada, 1878. (R. G. 933.)

CHLOROXYLON (from *chloros*, green, and *xylon*, wood; in allusion to the colour of the wood). Ord. *Meliaceæ*. A fine stove timber tree, having terminal panicles of small, whitish flowers, and abruptly pinnate leaves. It succeeds well in a compost of loam and peat. Ripe cuttings, with their leaves intact, will root in sand, under a hand glass, in a moist heat.

C. Swietenia (Van Swieten's). Satin-wood Tree. *l.*, leaflets many pairs, unequal, ovate, somewhat rhomboid, obtuse. *h.* 50ft. India, 1820. The wood of this tree is of a deep yellow colour, remarkably close-grained, heavy, and durable. Syn. *Swietenia Chloroxylon*. (B. F. S. 11.)

CHOISYA (named after M. Choisy, a Genevese botanist, author of several monographs in De Candolle's "Prodromus"). Ord. *Rutaceæ*. A very beautiful shrub, quite hardy in the southern and many other parts of Britain, with the protection of a wall. It thrives in a southern or western aspect, and requires a compost of loam and peat, to which a small quantity of sand and leaf mould is added. It may be easily propagated by ripened cuttings, which will root freely in sand, under a hand glass, in gentle bottom heat, during spring and early summer.

C. ternata (ternate). *fl.* white, sweet-scented; peduncles axillary at the tops of the branches, simple, or branched, with bracts at the divisions under the pedicels, which are channelled beneath. July. *l.* opposite, ternate, stalked, bright green, full of pellucid dots. *h.* 6ft. Mexico, 1825. (R. H. 1869, 332.)

CHOKE-CHERRY. *See* **Cerasus virginiana.**

CHOMELIA (named after J. B. Chomel, physician to Louis XV.; author of "Abrégé de L'Histoire des Plantes usuelles," 12mo, Paris, 1712). Ord. *Rubiaceæ*. Stove evergreen shrubs. For culture, *see* **Ixora**, from which the present genus differs in habit and inflorescence, but more particularly in the fruit containing a hard nut.

C. fasciculata (fascicled). *fl.* white; pedicels two or three together, axillary, one-flowered. *l.* ovate, acute, glabrous, on short petioles. *h.* 5ft. Grenada, 1825.

Chomelia—*continued.*

C. spinosa (spiny).* *fl.* white, 1½in. long, fragrant at night; peduncles axillary, usually three-flowered. *l.* ovate, acuminate, almost sessile, glabrous. *h.* 8ft. to 12ft. Carthagena, 1793.

CHONDRORHYNCHA (from *chondros*, cartilage, and *rhynchos*, a beak; in reference to the beak-like rostellum). Ord. *Orchideæ*. Stove epiphytal Orchids, allied to, and requiring the same cultivation as, **Lycaste** (which *see*).

C. Chestertoni (Chesterton's).* *fl.* yellow; lateral sepals developing into a very long, sharp point; petals with a much-developed fringe; lip also with very long fringes. Columbia, 1879. A very curious species.

C. fimbriata (fimbriated). *fl.* very pale sulphur-coloured, with brown spots at the base of the column, solitary; sepals ligulate, acuminate, sometimes undulated at the margin; petals oblong-apiculate, with finely-toothed margins; lip cuneate at the base, flabellato-oblong, three-lobed, or hastate oblong-triangular, bilobed, fimbriate and undulate on the whole of the margin; column clavate. *l.* cuneate-oblong or cuneate-lanceolate, acute. Roots very numerous, thick, forming a sort of nest. Plant bulbless. New Grenada. (Ref. B. 107.)

CHORETIS GLAUCA. A synonym of **Hymenocallis Choretis.**

CHORISPORA (from *choris*, separate, and *spora*, a seed; in allusion to each seed being inclosed separately in the pod). Ord. *Cruciferæ*. A genus of about seven species of annual or biennial, branched, slender, smooth or pilose herbs, allied to *Cakile*. Racemes opposite the leaves, erect, elongated. Leaves either pinnatifid or entire. They are all of easy culture in common garden soil. Increased by seeds, sown in spring, outside.

C. Greigii (Greig's). *fl.* reddish-violet, about ⅔in. in diameter. *l.* long, narrow, pinnatifid, forming a rosette. *h.* 1ft. to 1½ft. Turkestan, 1879. Biennial. (R. G. 984.)

C. tenella (delicate). *fl.* purple. July. *l.* smooth; upper ones lanceolate, toothed; lower ones pinnatifid. *h.* 4in. to 6in. Southern Russia, 1780. Annual.

CHORIZEMA (from *choros*, a dance, and *zema*, a drink; this genus was, says Don, originally discovered by Labillardière, upon the south-west coast of New Holland, at the foot of the mountains, near a spot where, after being tantalised with finding many salt springs, his party had just met with an ample supply of fresh water; this welcome refreshment, of which he speaks feelingly in his book, seems to have suggested the name). Ord. *Leguminosæ*. Greenhouse evergreen sub-shrubs, with alternate, simple, sinuately toothed, or entire leaves. They are mostly trained on globe and other trellises, with excellent effect, the whole trellis being lighted up with the brilliant beauty of their flowers, slightly toned down by the pleasing forms and refreshing variation of the leaves. They are admirably adapted for clothing dwarf columns or pillars, and covering dwarf walls. They also form fine loose bushes, if allowed to grow freely, and produce a number of shoots, the outer ones hanging over and partly hiding the pots They all grow freely in a mixture of peat and loam, fibry, but not too rough, with a large proportion of sharp silver sand. The drainage should also be liberal, and the pots scrupulously clean. In potting, the soil should be pressed firm, as for Heaths, Azaleas, and other hard-wooded plants. Loose potting kills thousands of choice plants every year. A certain degree of solidity is needful in the potting of hard-wooded plants, to enable the roots to grip the fresh soil. If they miss doing so, the new soil sours, the roots remain where they are, or the extremities—their most vital parts—rot off, and the plants languish and die. If the soil is used in a proper condition as regards dryness, it is hardly possible to overdo the compression with the fingers and hands. The best time to pot these plants is just as the shoots begin to break afresh. They may finish their growth in a common greenhouse, or have a little more heat during their growing period. At the end of summer and during the early autumnal months, they may be placed out of doors, in a sheltered place, care being taken to stand the pots on a worm-proof bottom. Early in the autumn, the plants should be taken under glass, before being soaked or sodden with heavy rains.

Chorizema—*continued.*

Chorizemas bear pruning well, and the best time to perform this operation is as soon as they have finished flowering—say, with early plants, towards the end of May. But, if room can be found for them, they need not be cut in much, and they will then soon form large plants, covering the trellises a yard through, and 4ft. or more high. They seldom, however, look better than when placed in 8in. or 10in. pots, clothing a globular trellis. They require plenty of water during the flowering and growing seasons, and if used as basket plants this must be borne in mind. If planted out, an excess of moisture must be avoided, as this brings on mildew, almost the only enemy to which this class of plants is subject; dustings of dry sulphur on the leaves is the surest remedy.

These plants do not root freely from cuttings, but a few seeds might be left to ripen. Vigorous young specimens of all the leading sorts may be bought cheaply of nurserymen.

All the species described below are Australian.

C. angustifolium (narrow-leaved).* *fl.* orange-red; racemes axillary and terminal, many-flowered. April. *l.* lanceolate-linear, entire, with revolute edges. *h.* 1½ft. 1830. SYN. *Dillwynia glycinifolia.* (B. R. 1514.)

C. cordatum (cordate).* *fl.* red or yellow, racemose, drooping. April. *l.* sessile, cordate, obtuse, spiny-toothed. *h.* 1ft.

C. Dicksoni (Dickson's). *fl.* scarlet-yellow, axillary, solitary or in pairs, on long peduncles; vexillum large. May to September. *l.* sessile, ovate-lanceolate, mucronulate. *h.* 3ft. 1836. (P. M. B. viii. 173.)

C. diversifolium (diverse-leaved).* *fl.* orange-red; racemes many-flowered, axillary and terminal. May to July. *l.* scattered, elliptic-lanceolate, obovate, or cuneate, entire, mucronate. *h.* 2ft. 1840. SYN. *C. spectabile.* (B. R. 1841, 45.)

C. Henchmannii (Henchmann's).* *fl.* scarlet, axillary. April to June. *l.* acicular. *h.* 2ft. 1824. Plant hoary. (B. R. 986.)

C. ilicifolium (Holly-leaved). *fl.* yellow. March to October. *l.* pinnatifid-toothed, spiny, oblong-lanceolate, with an entire point longer than the teeth. *h.* 3ft. 1803.

C. i. nana (dwarf). *l.* sinuate-toothed, spiny, oblong, obtuse; bracts below the end of stalk. *h.* 9in. 1803. (B. M. 1032.)

C. rhombeum (diamond-leaved). *fl.* yellow. April and May. *l.* entire, flat, mucronate; lower ones rhomboid-orbicular; upper elliptical-lanceolate. *h.* 2ft. 1803.

C. spectabile (showy). A synonym of *C. diversifolium.*

C. varium (variable).* *fl.* yellow, red; racemes erect, many-flowered, a little longer than the leaves. June. *l.* nearly sessile, roundish-cordate, spiny-toothed and entire, downy. *h.* 4ft. 1837. (B. R. 1839, 49.) A form of this, in gardens named *Chandleri*, is also desirable.

CHRISTMAS PRIDE. *See* **Ruellia paniculata.**

CHRISTMAS ROSE. *See* **Helleborus niger.**

CHRIST'S HAIR. *See* **Scolopendrium vulgare.**

CHRIST'S THORN. *See* **Paliurus aculeatus** and **Zizyphus spina-Christi.**

CHRYSALIDOCARPUS (from *chrysos*, gold, and *karpos*, fruit). ORD. *Palmæ.* A monotypic genus. The species is a stove Palm. For culture, *see* **Areca.**

C. lutescens (yellowish).* *fl.*, spadix shortly triangular, 1ft. or more in length; peduncles compressedly two-edged, flexuous. *l.* very long, pinnate, arched; pinnæ nearly 100, hardly opposite, lanceolate, nearly 2in. in breadth, acute, rich green on both surfaces. Caudex 4in. to 6in. in diameter, 30ft. or more in height, cylindrical, smooth, swollen at the base. Mauritius and Bourbon. An elegant but extremely rare species. SYNS. *Areca lutescens, Hyophorbe Commersoniana*, and *H. indica.*

CHRYSANTHEMUM (from *chrysos*, gold, and *anthemon*, a flower). ORD. *Compositæ.* A large and, from a garden standpoint, important genus of herbaceous or slightly shrubby plants. Pappus none, or cup-shaped; receptacle naked; involucral bracts many, imbricated, scarious on the margin. The florists' varieties of *C. sinense* alone amount to several hundreds. In determining them, the following synopsis will be found useful. (The genus *Pyrethrum* is now included under *Chrysanthemum* by the best authorities, but, for the sake of convenience, it is kept distinct in this work.)

INCURVED, RANUNCULUS-FLOWERED, or EXHIBITION: Florets strap-shaped, curving inwards. See Fig. 432.

Chrysanthemum—*continued.*

FIG. 432. INCURVED-FLOWERED CHRYSANTHEMUM.

Examples: Alfred Salter, Lady Slade, Mr. George Glenny, Mrs. G. Rundle, Queen of England, White Venus, &c.

RECURVED, or REFLEX-FLOWERED: Florets strap-shaped, curving outwards from the centre. Examples: Alma, Dr. Sharpe (see Fig. 433), Emperor of China, King of Crimsons, &c.

FIG. 433. RECURVED CHRYSANTHEMUM DR. SHARPE.

ANEMONE, or QUILLED ASTER-FLOWERED: Ray-florets strap-shaped; disk-florets tubular, densely arranged, cushion-like. Of this section, there are large and small-flowered forms. See Figs. 434 and 435. Of the former, the best examples are: Emperor, Fleur de Marie, Glück, and King of Anemones; of the latter, or small-flowered,

Chrysanthemum—*continued.*

Calliope, Jean Hachette, Madame Montels, Marie Stuart, and Miss Nightingale.

FIG. 434. LARGE ANEMONE-FLOWERED CHRYSANTHEMUM.

POMPONE SMALL REFLEXED, or CHUSAN DAISY-FLOWERED: Flowers small, numerously produced; florets for the most part reflexed, as in Bob, General Canrobert,

FIG. 435. SMALL ANEMONE-FLOWERED POMPONE CHRYSANTHEMUM.

Snowdrop, &c.; or fringed or toothed at their tips, as in Fimbriatum, Innocence, and Marabout (see Fig. 436, for which, and for Fig. 437, we are indebted to Messrs. Cannell

Chrysanthemum—*continued.*

and Sons). A fully-expanded blossom of a reflexed Pompone is shown at Fig. 437. The varieties of this description are the most numerous of the Pompone section. Another form of Pompone is also in cultivation, in which all the florets are quilled, as in Model of Perfection (see Fig. 438).

FIG. 436. FIMBRIATED POMPONE CHRYSANTHEMUM MARABOUT.

QUILLED, or PIN-FEATHERED JAPANESE: Flowers 6in. to 9in. in diameter; florets involute and tubular, or quilled, with toothed tips. The habit of the plants is tall and somewhat straggling. Examples: Meg Merrilees, Red Dragon (see Fig. 439), and Sultan.

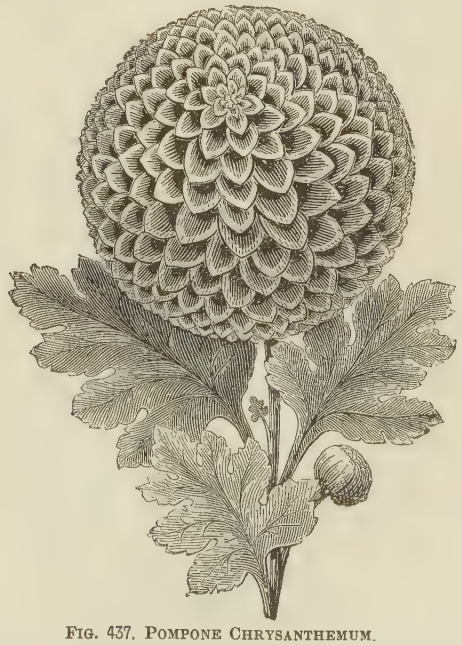


FIG. 437. POMPONE CHRYSANTHEMUM.

LARGE-FLOWERED JAPANESE: Flowers large, loose; florets long, strap-shaped. In some instances, the florets are revolute, twisted, and thread-like. There are very

Chrysanthemum—*continued.*

numerous varieties in this section. Examples: Chinaman (see Fig. 440), Fair Maid of Guernsey, James Salter, and Peter the Great.

In the select list of varieties, representatives of all the various forms of flowers in the Japanese section are included under the one heading.

FIG. 438. QUILLED POMPONE CHRYSANTHEMUM MODEL OF PERFECTION.

PROPAGATION. This may be effected by seeds, cuttings, suckers, or root divisions. The annual varieties are increased by seeds only, which should be sown in pots, in February or March, or outside. New varieties are sometimes obtained by sowing the seeds of the finer

FIG. 439. JAPANESE CHRYSANTHEMUM RED DRAGON.

sorts. When any distinct or improved form "sports" from the original stock, it may be readily perpetuated by cuttings.

Seed should be sown in February or March, preferably the former. If slightly covered over, and placed in a warm

Chrysanthemum—*continued.*

temperature, they will readily germinate. If the seedlings are pricked off at once and placed near the glass, good plants will soon be obtained. By the middle of May, they may either be planted out of doors, to prove their worth, or in pots till they flower, which will be the first year. As the cultivated varieties are now so very numerous, propagation from seed is seldom resorted to, except with the annual section.

Cuttings may be inserted at any time from October to May. The best are made of the young shoots that start from the base of the plant. Any of the tips of these will, however, root readily. A gentle bottom heat facilitates rooting; but a close pit or frame will answer without bottom heat. Cuttings should be inserted either singly in small pots, or several in a large one, in sandy soil. As soon as rooted, they should be shifted into single pots. When the plants are established in their first pots, the points should be nipped out, in order to induce a bushy and compact growth.

Suckers. These differ from the foregoing in being already rooted, or nearly so. They should be potted singly, in

FIG. 440. JAPANESE CHRYSANTHEMUM CHINAMAN.

sandy soil, and kept rather close, till new roots are formed. Suckers are preferred by many for standard plants, as they are generally stronger than cuttings, and more fitted to form a good stem. They may also be pinched, to form bush plants.

Divisions of Root or Stool. This is a quick and ready method of increasing the stock for outside culture, for which purpose it is very commonly adopted. February and March are the best time for the operation. The extent to which the plants should be divided depends on the purpose for which they are required. For outside culture, stools may be cut up into three, five, or more pieces.

GENERAL CULTIVATION. Nearly every grower has his own particular time for the insertion of cuttings. The season ranges from October to March, but November and December are the two most popular months. As soon as the cuttings are rooted, they should be potted off, and receive no check from the commencement until they have flowered. This may be said to be the very basis of the highest success in the culture of Chrysanthemums. To prevent any check, some growers insert the cuttings separately in pots, which is a very good plan, as each, under favourable conditions, is almost sure to root, and the

Chrysanthemum—*continued.*

practice involves no waste of either time or space. Whichever plan is adopted, the plants should be placed near the glass, and shifted on successively as they require, when the roots reach the side of the ball. The final shift should be given not later than the middle of July; for although it is most important to keep the roots in full vigour during the early stages of growth, it is equally or more so that they should fill the pots with roots before the flowering season arrives. In hot, dry places, an eastern or western aspect suits Chrysanthemums better than a southern one for summer quarters; but in colder neighbourhoods, a position facing south would be more suitable. Partial shade from the mid-day sun is desirable. The pots should be plunged to the rim, taking care to provide free egress for the water under them. Chrysanthemums require enormous quantities of water, though few plants sooner show the injurious effects of sour or waterlogged soil. The surface of the pots should also be mulched over, as a protection to the roots against excessive heat and drought, and also as a means of increasing the supply of nutriment. During bright weather, the plants may need watering three or four times a day, and must on no account be allowed to flag for want of it. In good soil, they seldom need much manure water until September, and then that made from cow or sheep dung is the best.

Soil. This can scarcely be too rich when the plants are strong and placed in the flowering pots. Good loam, heavy rather than light, should be used in about equal portions with rotten manure, including some cow dung. A little soot intermixed with this tends to give the leaves a dark green colour, and materially assists them. Crushed bones are sometimes used for drainage, with a large crock over the hole. These last a long time, and afford some nourishment to the plants as well; but where not obtainable, a few more crocks should be added instead. Pots of 9in. in diameter are of sufficient size to grow large plants, if the latter are well watered, and fed with liquid manure after the flowers are set. It is much preferable to adopt this plan than to use larger pots without feeding the plants, as the soil becomes exhausted in large pots before the time when the greatest nourishment is required. Useful decorative subjects may be obtained in 48-sized pots if cuttings are put in about the beginning of August, five or six in each, and are not afterwards pinched. The soil should be used as rough as possible, without sifting, and the plants potted firmly by means of hand rammers. Less manure should be given when the plants are young and are being grown on in small pots.

Training will greatly depend on the size or description of plant required. Standard specimens should be grown to the desired height before being stopped; while those intended for bush specimens should be pinched evenly, occasionally removing the points of all shoots as they grow. This must not be practised after the middle of July. The flowers also need thinning; and persons who grow for exhibition sometimes thin off all buds, except the terminal one on the shoot. By thus concentrating most or all the force of the plant into its terminal flowers, these may be grown to a very large size. Chrysanthemums readily conform to any style of training. They develop naturally into a dense bush; or may readily be grown into standards, from 3ft. to 9ft. high. For exhibition, they are sometimes severely trained, by the aid of hoops, stakes, and ties, into flat or hemispherical specimens, with the flowers laid flat on a level surface of foliage. The shoots, being fairly flexible, can be trained, when young, in any form desired. The Pompones yield most readily to flat or level training; while the Japanese are most untractable. All staking and training should be completed some weeks before the flowers appear, so that the latter may have time to readjust themselves before opening, and look more natural.

Housing and Flowering. All Chrysanthemums intended

Chrysanthemum—*continued.*

for flowering indoors should be under glass, in the autumn, before the appearance of frost. During mild weather, afterwards, they cannot be kept too open or cool; nor can the transition from the outside to the house be made too gradual and easy. Any sudden change of temperature or condition causes the leaves to become yellow; and this not only disfigures, but weakens the plants and flowers. While Chrysanthemums must never be stinted for water, less will be needed when in flower than when in full growth. They will do well in a cool greenhouse, conservatory, or window garden. Some cultivators arrange them against walls, where they are simply placed according to their height, with a temporary glass case over them; and this mode shows off the flowers remarkably well. When placed so that the merits and form of each plant may be seen, Chrysanthemums are most effective. After flowering, the plants may be cut down to within 6in. of the ground, and wintered in a cold frame, or other frost-proof quarters. Some growers, however, merely take cuttings off, and throw the old plants away; others keep the younger plants, and grow them into larger specimens the next year; while many plant them out in the open borders, or against walls, to take their chance of flowering, should season or locality prove favourable.

Outdoor Culture. As an autumnal flowering plant, success would be much more general were Chrysanthemums specially cultivated for this purpose. When they are as carefully grown in the open as in pots, they often flower almost equally well. Good results are frequently obtained by keeping them in a very open place throughout the summer, at distances of 2ft. or 3ft. apart, freely exposed to the sun and air all round; and then, towards the end of September, lifting carefully and potting them, keeping close, and shaded for a time afterwards.

C. argenteum (silver-leaved).* *fl.-heads* white. July. *l.* bipinnate, hoary; leaflets acute, entire. Stem one-headed, simple. *h.* 1ft. Levant, 1731. Hardy herbaceous perennial.

FIG. 441. CHRYSANTHEMUM CARINATUM.

Chrysanthemum—*continued.*

FIG. 442. CHRYSANTHEMUM CARINATUM BURRIDGEANUM.

FIG. 443. CHRYSANTHEMUM CARINATUM LORD BEACONSFIELD.

C. carinatum (keeled).* *fl.-heads* white, purple; scales of involucre keeled. August. *l.* bipinnate, fleshy, smooth. *h.* 2ft. Barbary, 1796. SYN. *C. tricolor*. See Fig. 441. Of this hardy annual, there are numerous varieties: BURRIDGEANUM (see Fig. 442) is an especially good one, as is also LORD BEACONSFIELD (see Fig. 443, for which we are indebted to Messrs. Cannell and Sons).

C. Catananche (Catananche). *fl.-heads* solitary, 1½in. to 2in. across, pale yellow; the rays of a purplish hue outside towards the tip, and blood-red within at the very base; disk of a darker yellow. Spring. *l.* tufted, stalked, irregularly cut into linear acute lobes. Root-stock stout, branched. *h.* 4in. to 6in. 1871. One of the most beautiful plants of the Greater Atlas. Suitable for a well-drained spot in the rockery. (B. M. 6107.)

C. coronarium (garland).* *fl.-heads* yellow. July to September. *l.* bipinnatifid, acute, broadest externally. Stem branched. *h.* 4ft. South Europe, 1629. Hardy annual. See Fig. 444. (S. F. G. 877.)

Chrysanthemum—*continued.*

FIG. 444. CHRYSANTHEMUM CORONARIUM.

FIG. 445. CHRYSANTHEMUM FRUTESCENS (MARGUERITE OR PARIS DAISIES).

C. frutescens (shrubby). Under the popular name of Paris Daisies, the flowers of this species, and others of a similar description, are very largely used for decoration. The plants also form very useful subjects for flowering in greenhouses, or in the open ground in summer. The variety ÉTOILE D'OR is of a pale yellow colour, and very popular. See Fig. 445, for which we are indebted to Messrs. Cannell and Sons. *See also* **Pyrethrum frutescens.**

Chrysanthemum—*continued.*

C. Leucanthemum (white-flowered). Ox-eye Daisy. *fl.-heads* white. June and July. *l.* amplexicaul, oblong, obtusely cut, pinnatifid at base; radical ones obovate petiolate. Stem erect, branched. *h.* 2ft. Britain. Perennial. (S. E. B. iii. 714.)

C. segetum (corn).* *fl.-heads* yellow. June to August. *l.* amplexicaul, glaucous, incíso-serrate above, toothed at the base. *h.* 1½ft. Britain. Annual. (Sy. En. B. iii. 713.)

FIG. 446. CHRYSANTHEMUM SEGETUM GRANDIFLORUM.

C. s. grandiflorum (large-flowered).* See Fig. 446, for which we are indebted to Messrs. Cannell and Sons.

FIG. 447. CHRYSANTHEMUM SINENSE, INCURVED VARIETY.

Chrysanthemum—*continued.*

FIG. 448. CHRYSANTHEMUM SINENSE, POMPONE VARIETY.

C. sinense (Chinese).* *fl.-heads* various; ray-florets very long. Autumn. *l.* coriaceous, stalked, sinuate-pinnatifid, toothed, glaucous. China, 1764. See Figs. 447 and 448.

C. tricolor (three-coloured). A synonym of *C. carinatum.*

VARIETIES. From the enormous number of kinds now in cultivation, we have selected the best in each class.

Incurved. ALFRED SALTER, delicate pink, very fine; ANGELINA, rich amber, shaded salmon; BARBARA, rich golden-yellow; BEVERLEY, cream-white, very broad florets; DR. BROCK, orange-red; DUCHESS OF MANCHESTER, nearly white, the back striped with rosy-carmine; EMPRESS EUGENIE, delicate rose-lilac; EMPRESS OF INDIA, pure white, very fine; EVE, pale sulphur, a most delicate and lovely shade; FAUST, crimson-purple; GENERAL BAINBRIDGE, orange-yellow, golden centre; GOLDEN BEVERLEY, rich yellow, very fine; GOLDEN EMPRESS, primrose; GOLDEN QUEEN OF ENGLAND, rich canary; GUERNSEY NUGGET, primrose, fine; HER MAJESTY, silvery-blush; JARDIN DES PLANTES, golden-yellow, very fine; JOHN SALTER, orange-red; LADY HARDINGE, rose-pink; LADY SLADE, lilac-pink, blush centre, very fine; LORD DERBY, dark purple; MR. BRUNLEES, Indian-red, tipped yellow; MR. GEORGE GLENNY, pale yellow, a magnificent variety; MRS. DIXON, rich yellow, very fine; MRS. G. RUNDLE, pure white, one of the best; MRS. HEALE, pure white; MRS. W. HALIBURTON, cream-white; PINK PERFECTION, delicate pink, very fine; PRINCE ALFRED, rose-crimson, large; QUEEN OF ENGLAND, blush, very fine; WHITE VENUS, pure white, very fine.

Recurved and Reflexed. ALMA, rose-crimson; BEAUTÉ DU NORD, violet-carmine; CHRISTINE, peach, very fine; DR. SHARPE, magenta-crimson, one of the best (see Fig. 433); EMPEROR OF CHINA, silvery-white, tipped salmon; GARIBALDI, bright red, very showy; GAZELLE, bright crimson, yellow-tipped; GOLDEN CHRISTINE, golden-buff, very fine; JULIA LAGRAVERE, velvety-crimson, very fine; KING OF CRIMSONS, rich crimson; MRS. FORSYTH, pure white; PRINCE VICTOR, dark red; PROGNE, amaranth; UNDINE, lilac, tipped blush.

Anemone-flowered. *Large*: EMPEROR, blush, sulphur centre; EMPRESS, lilac; FLEUR DE MARIE, white; GLUCK, rich yellow, fine; KING OF ANEMONES, crimson-purple, very fine; LADY MARGARET, white, very fine; MADAME GODEREAUX, cream-white, fine; M. CHATÉ, rich peach, white centre; MRS. PETHERS, rose-lilac; PRINCESS LOUISE, delicate rose-lilac; SUNFLOWER, sulphur-yellow. *Small*: ANTONIUS, canary-yellow; ASTREA, lilac; CALLIOPE, rich ruby-red; FIREFLY, bright scarlet; JEAN HACHETTE, white, yellow centre; MADAME MONTELS, white, yellow centre, very fine; MARIE STUART, lilac-blush, sulphur centre; MISS NIGHTINGALE, blush, white centre; MR. ASTIE, golden-yellow; PERLE MARGUERITE, rich rose; REGULUS, cinnamon, free.

Pompones. *Reflexed*: ADONIS, rose and purple; AURORE BOREALE, orange-brown; BOB, dark brown-crimson; CAPTAIN NEMO, amaranth, tipped with white; CRIMSON PERFECTION, bright crimson; DUPONT DE LÉURE, rich golden-yellow; ELEONORE, crimson, tipped with gold; FLORENCE, bright rose; GENERAL

Chrysanthemum—*continued.*

CANROBERT, pure yellow; GOLDEN CEDO NULLI, canary-yellow; MDLLE. MARTHE, pure white, one of the best; MODEL OF PERFECTION, rich lilac, edged white (see Fig. 438); MRS. HUTT, orange-brown; PRESIDENT, rose-carmine; WHITE CEDO NULLI, white, tipped brown. *Fringed or Toothed:* FIMBRIATUM, rose-lilac, suffused yellow; INNOCENCE, white; MARABOUT (see Fig. 436) pure white; MONS. CAMILLE, amaranth, rose-shaded; MONS. HOSTE, deep flesh; SIR RICHARD WALLACE, rose, shaded white; SOUVENIR DE JERSEY, deep rose.

Japanese. ABD-EL-KADER, deep maroon-crimson; ARLEQUIN, nankeen yellow; BARON DE PRAILLY, lilac-rose, spotted white; BEAUMONT, golden-yellow, rose-flaked at the back; BRONZE DRAGON, bronze-yellow, fine; CERES, blush-pink; CHANG, dark orange-red, with yellow back, very effective; CHINAMAN, bright violet-purple, with central silvery lines (see Fig. 440); COMTESSE DE BEAUREGARD, light rose, very fine; CRY KANG, rose-magenta, very fine; DIAMOND, bronze and orange; DR. ARDIGUIER, amaranth-crimson, marbled white; DR. MASTERS, yellow and red, gold-tipped; ELAINE, pure white; ETHEL, pure white; FAIR MAID OF GUERNSEY, pure white, very fine; FLAMBEAU, orange-crimson, reverse side yellow; FULGORE, nankeen yellow; GEORGE GORDON, vivid crimson; GLOIRE DE TOULOUSE, magenta, white centre; HIVER FLEUR, pale buff, tinted rose; JAMES SALTER, clear lilac, shaded centre, very fine; JANE SALTER, white, bordered with rose-lilac; JUPONAIS, bright deep yellow; LA CHARMEUSE, rich purple, white-tipped; LADY SELBORNE, pure white; LA NYMPHE, peach, shaded white; L'INFANTE D'ESPAGNE, pale yellow, immense; MEG MERRILEES, sulphur-white, large; M. RICHARDS LARIOS, dark rose and violet; NUIT D'HIVER, bronze, golden tips; ORACLE, deep red-crimson; PETER THE GREAT, clear lemon, large; RED DRAGON, fiery crimson, golden tips (see Fig. 439); RED GAUNTLET, dark crimson; ROSA BONHEUR, rich violet, crimson-shaded; RUBRA STRIATA, rich yellow, flaked violet and crimson; THE SULTAN, rosy-purple.

CHRYSOBACTRON (from *chrysos*, gold, and *bactron*, a wand; alluding to the handsome racemes of *C. Rossii*). ORD. *Liliaceæ*. All the species of this genus are now referred to *Bulbinella* by Bentham and Hooker. Very ornamental, but comparatively rare, hardy bulbous perennials. For culture, see **Anthericum.**

C. Hookeri (Hooker's).* *fl.* bright yellow, bisexual, nearly ½in. across, freely produced in erect racemes 3in. to 5in. long. Early summer. *l.* linear, sheathing at the base, 8in. to 12in. long, and from ½in. to 1in. broad. *h.* 1½ft. to 3ft. New Zealand, 1850. This only forms fine specimens in a deep moist soil. SYN. *Anthericum Hookeri.*

C. Rossii (Ross's). *fl.* yellow, unisexual. *h.* 2ft. to 3ft. New Zealand, 1848. A similar, but much superior, species to the above.

CHRYSOBALANEÆ. A tribe of *Rosaceæ.*

CHRYSOBALANUS (from *chrysos*, gold, and *balanos*, an acorn; in reference to the yellow fruit of some of the species). TRIBE *Chrysobalaneæ* of ORD. *Rosaceæ*. Stove or greenhouse trees, with simple leaves, and racemes or panicles of insignificant flowers. Fruit edible. Sandy loam is the best soil for this genus. The best method of propagation is by seeds, when they are procurable. Large cuttings, however, taken off at a joint, without shortening any of their leaves, will root readily if planted thinly in a pot of sand, and placed in moist heat, with a bell glass over them.

C. Icaco. Cocoa Plum. *fl.* white; panicles axillary, dichotomous. *fr.* about the size of a plum, ovate-roundish, varying much in colour, but most commonly purple, and usually covered with a kind of bloom; the skin is thin, and the pulp white, adhering firmly to the stone; the taste is sweet, with some austerity, but not unpleasant. *l.* nearly orbicular, or obovate, emarginate. *h.* 3ft. to 6ft. Florida, &c., 1752. Stove. (G. C. 1871, 586.)

FIG. 449. EARLY-FLOWERING CHRYSANTHEMUM.

Early-flowering Varieties. CHROMATELLA, golden-orange; DELPHINE CABOCHE, reddish-mauve; FRED. PELÉ, red-crimson; ILLUSTRATION, white, shaded; JARDIN DES PLANTES, rich yellow, also a white variety; LA PETITE MARIE, pure white; LITTLE BOB, maroon-red; MADAME C. DESGRANGE, white, with yellow centre; MADAME PICOUL, rose-purple; NANUM, blush; PRECOCITÉ, bright yellow; SOUVENIR D'UN AMI, pure white, very fine. See Fig. 449, for which we are indebted to Messrs. Cannell and Sons.

CHRYSANTHUS. Yellow-flowered.

CHRYSO. In Greek compounds, this signifies golden-yellow.

C. oblongifolius (oblong-leaved). *fl.* white; panicles terminal. May and June. *fr.* olive-formed, nearly dry. *l.* oblong, or oblanceolate, a little crenulated, sometimes tomentose beneath. *h.* 1ft. Florida, &c., 1812. Greenhouse.

CHRYSOCOMA (from *chrysos*, gold, and *kome*, hair; in reference to the yellow florets). Goldy-locks. ORD

Chrysocoma—*continued.*

Compositæ. Pappus simple; receptacle naked; involucre hemispherical or broadly bell-shaped, imbricate. All the species of this genus (about eight) are ornamental, dwarf-growing, South African shrubs. The one described below (perhaps the only one in cultivation) succeeds best in sandy peat. Cuttings of half-ripened shoots root freely in sand, under a glass.

FIG. 450. CHRYSOCOMA COMA-AUREA, showing Habit and Flower-head.

C. Coma-aurea (golden hair).* *fl.-heads* yellow. June. *l.* linear, straight, smooth, decurrent at back. *h.* 2ft. Cape of Good Hope, 1731. A greenhouse evergreen. See Fig. 450. (B. M. 1972.)

C. Linosyris (Linosyris). *fl.-heads* yellow, in terminal, dense, hemispheric corymbs. *h.* 1ft. to 2ft. Northern hemisphere (Britain). Hardy perennial.

CHRYSODIUM. *See* **Acrostichum.**

CHRYSOGONUM (from *chrysos*, gold, and *gonu*, a knee or joint; the flowers are generally produced at the joints of the stem). ORD. *Compositæ.* There are some half-dozen plants referred to this genus; two are Indian, three Australian. The typical species (probably the only one in cultivation) is described below. It is a very pretty, hardy, herbaceous perennial, thriving best in a loamy soil, with the addition of a little peat and leaf mould. Propagated by dividing the roots, in spring.

C. virginianum (Virginian).* *fl.-heads* yellow; involucre about five-leaved; receptacle paleaceous; pappus a small, chaffy crown, three-toothed. May. *l.* somewhat ovate, bluntly serrated; petioles longer than the leaves. *h.* 6in. United States.

CHRYSOPHYLLUM (from *chrysos*, gold, and *phyllon*, a leaf; referring to the colour of the under side of the leaves). Star Apple. ORD. *Sapotaceæ.* Stove evergreen trees. Flowers disposed in axillary, umbellate fascicles; corolla campanulately rotate, with a five-parted, spreading limb. Fruit globose, one to ten-celled. Leaves alternate, entire. These plants are grown principally on account of their ornamental foliage, as the fruit is not produced until they have assumed a very considerable size. They require potting in sandy loam and peat, in the proportion of two parts of the former to one of the latter. An abundance of heat and moisture is needed during the growing season, but less during winter, though they must then by no means be allowed to suffer from want of water, or the result will be the loss of many leaves, and consequent disfigurement. Chrysophyllums may be increased by cuttings of small, well-ripened shoots, plunged in strong moist heat, or by seeds, when procurable.

C. argenteum (silvery-leaved). This species differs from *C. Cainito* only in the silvery under surface of the leaves. West Indies, &c.

C. Cainito (Cainito). *fl.* whitish, small. May. *fr.* large, rather depressed, rose-coloured, mixed with green and yellow; skin smooth and glabrous; flesh soft, clammy, sweet, and hispid. *l.* oblong, acute at the base and apex, 3½in. to 4in. long, quite glabrous above, but silky and rusty beneath. Branches clothed with silky rusty down. *h.* 30ft. to 50ft. West Indies, 1737.

C. macrophyllum (large-leaved).* *l.* oblong-lanceolate, 6in. to 8in. in length, and 2in. to 3in. in breadth, deep green above, densely clothed on the under side when young with rich golden, silky hairs, which gradually turn to chestnut-brown. *h.* 50ft. Sierra Leone, 1824. A rare but magnificent plant. The foliage assumes its full proportions when young.

Chrysophyllum—*continued.*

C. monopyrenum (one-stoned). *fl.* whitish, small. *fr.* shining, purplish-black, in form like a small date. *l.* alternate, oval. 4in. to 5in. long, 2in. broad. *h.* 30ft. West Indies, 1812. (B. M. 3303.)

CHRYSOPSIS (from *chrysos*, gold, and *opsis*, aspect; in allusion to the golden blossoms). ORD. *Compositæ.* Hardy, herbaceous perennials. Pappus of the ray and disk-florets similar and double; the exterior short and scale-like; the inner of long, capillary bristles. Some of the species make excellent subjects for naturalising in a shrubbery or in the rougher parts of borders. They are easily grown in common soil. Propagated by division in spring.

C. falcata (sickle-shaped). *fl.-heads* yellow, small, corymbose. August. *l.* crowded, linear, rigid, entire, somewhat recurved or scythe-shaped, sessile. *h.* 4in. to 10in. New Jersey.

C. mariana (Maryland). *fl.-heads* yellow, corymbose, on glandular peduncles. August to October. *l.* oblong. *h.* 1½ft. to 2ft. New York. Plant silky with long and weak hairs, or, when old, smoothish.

C. trichophylla (hairy-leaved). *fl.-heads* yellow. June. *l.* narrow-oblong, sub-acute, hairy. Stem slender, 1ft. to 3ft. high. South United States, 1827.

C. villosa (villous). *fl.-heads* yellow. July to September. *l.* narrowly oblong, hoary with rough pubescence (as is also the involucre), bristly-ciliate towards the base. Stem corymbosely branched, the branches terminated by single, short-peduncled heads. North America.

CHRYSOSPLENIUM (from *chrysos*, gold, and *splen*, the spleen; in reference to the golden colour of the flowers, and the supposed virtue of the plant in diseases of the spleen). Golden Saxifrage. ORD. *Saxifrageæ.* Hardy, perennial herbs. Flowers yellow, somewhat corymbose. Leaves thickish, simple, petiolate, toothed. The two native species, *alternifolium* and *oppositifolium*, are not very showy plants, but constitute pretty ornaments for damp, boggy places. They grow about 6in. high and are very easily propagated by divisions.

CHRYSOSTEMMA TRIPTERIS. *See* **Coreopsis tripteris.**

CHRYSOXYLON. A synonym of **Pogonopus** (which *see*).

CHRYSURUS. A synonym of **Lamarckia** (which *see*).

CHYMOCARPUS PENTAPHYLLUS. *See* **Tropæolum pentaphyllum.**

FIG. 451. CHYSIS BRACTESCENS.

CHYSIS (from *chysis*, melting; in reference to the fused appearance of the pollen masses). ORD. *Orchideæ.* A small but beautiful genus of stove, deciduous epiphytes. Flowers very showy, colours bright, texture firm, and the surface even and waxy; lip beautifully marked. Pseudo-

Chysis—continued.

bulbs thick, fleshy, brittle, about 1ft. long, producing their flowers with the young growth. For culture, *see* **Vanda.**

Chysis—*continued.*

short spike or raceme; sepals and petals white; lip three-lobed, saddle-shaped, with a yellow blotch in the centre. April and May. *l.* oblong, acute. Guatemala, 1840. See Fig. 451. (B. M. 5186.)

FIG. 452. CHYSIS CHELSONI.

C. aurea (golden).* *fl.* yellow, disposed in a short spike; produced at different times of the year; lip marked with crimson. Venezuela, 1834. (B. R. 1937.)

C. a. Lemminghei (Lemminghe's).* A charming variety, with delicate pink and rose-coloured flowers, which are freely produced in May or June. Guatemala. (W. S. O. 34.)

C. bractescens (bracteate).* *fl.* 2in. to 3in. across, disposed in a short spike or raceme; sepals and petals white; lip three-lobed, saddle-shaped, with a yellow blotch in the centre. April and May. *l.* oblong, acute. Guatemala, 1840. See Fig. 451. (B. M. 5186.)

C. chelsoni (Chelsea). *fl.*, sepals and petals nankeen yellow, with a large rosy blotch at the apex; lip bright yellow, with red spots and markings. A charming hybrid between *C. bractescens* and *C. aurea*. See Fig. 452, for which we are indebted to Messrs. Veitch and Sons.

C. lævis (smooth).* *fl.* disposed in pendulous spikes of eight or more; sepals and petals yellow and orange; lip blotched with

Chysis—*continued.*

scarlet or crimson, and fringed round the margin. June. Pseudo-bulbs 15in. long. Guatemala. (I. H. 1863, 365.)

CIBOTIUM. *See* **Dicksonia.**

CICCA (named after Peter Cicca, a writer of the sixteenth century). ORD. *Euphorbiaceæ.* A small genus, now usually referred to *Phyllanthus.* The best-known species is *C. disticha,* which is a stove evergreen fruit-tree. It thrives well in sandy loam; and cuttings of ripe shoots will root in sand, if placed under a glass, and in bottom heat.

C. disticha (two-ranked). *fl.* greenish; racemes lateral. *l.* oblong. *h.* 10ft. India, 1796.

CICHORIUM (an ancient Egyptian name). Chicory or Succory. ORD. *Compositæ.* Hardy salad plants. Involucre surrounded with small scales or smaller leaflets; receptacle naked or slightly hairy; pappus sessile, scaly, shorter than the pericarp. For special culture, *see* **Chicory** and **Endive.**

C. Endivia. Endive. *fl.-heads* pale blue, 1in. to 1½in. across; peduncles axillary. *l.* large, sinuate, smooth, toothed. July. *h.* 2ft. China, &c. Annual.

C. Intybus (Intybus). Chicory. *fl.-heads* bright blue, axillary, sessile, 1in. to 1½in. across, growing two or three together on the panicle branches. July. *l.* glandular-ciliated; lower ones oblanceolate, runcinate-pinnatifid or dentate; upper stem ones lanceolate, half stem-clasping, broadly toothed or entire. *h.* 2ft. to 5ft. Europe (Britain). Perennial. (Sy. En. B. 786.)

C. spinosum (spiny). *fl.-heads* blue; involucre ovate, imbricated; receptacle naked; peduncles rigid, glabrous. *l.* green, sub-succulent, glabrous, runcinate-lyrate; terminal lobe oblong, obtuse. Stem branched, divaricate; branches ending in a spine. Greece. Biennial. (S. F. G. 823.)

CICONIUM. Included under **Pelargonium** (which *see*).

CIENKOWSKIA (named in honour of Professor L. Cienkowsky, a Russian botanist of the present century). ORD. *Scitamineæ.* A handsome stove herbaceous perennial, now referred to **Kæmpferia** (which *see* for cultivation).

C. Kirkii (Kirk's). *fl.* lovely pale rose-purple, about 3in. in diameter, sweet-scented; scape slender, erect, 3in. to 4in. long. August. *l.* elliptic-lanceolate, 6in. to 8in. long by 2½in. to 3½in. wide. *h.* 6in. Zanzibar, 1872. (B. M. 5994.)

CILIÆ. Marginal hairs, forming a fringe.

CILIARIA. Included under **Saxifraga** (which *see*).

CILIATE. Fringed with hairs.

CIMICIFUGA (from *cimex,* a bug, and *fugo,* to drive away; indicating certain virtues which the plants—particularly *C. elata*—possess). Bugwort. ORD. *Ranunculaceæ.* Ornamental hardy herbaceous perennials, allied to *Actæa.* They are of easy culture in ordinary garden soil. A somewhat moist and shady situation is preferable. All are easily propagated by division, in spring; or by seeds, sown in a cold frame as soon as ripe.

C. americana (American).* *fl.* whitish; racemes panicled. August and September. *l.* tripinnate. *h.* 2ft. to 3ft. Carolina, 1824.

C. cordifolia (heart-shaped-leaved). *fl.* whitish; racemes panicled. July and August. *l.* biternate; leaflets four or five-lobed, serrated, cordate at the base. *h.* 2ft. to 3ft. North America, 1812. (B. M. 2069.)

C. elata (tall). *fl.* whitish; racemes panicled. June and July. *l.* ternate or biternate; leaflets ovate-oblong, deeply toothed. *h.* 2ft. Eastern Siberia, North America, &c., 1777. A fœtid herb, used in Siberia for driving away bugs. SYN. *C. fœtida.*

C. fœtida (fœtid). A synonym of *C. elata.*

C. japonica (Japanese).* *fl.* white, sessile; spikes very long. *l.* large, ternate, with five or seven-lobed cordate segments. *h.* 3ft. Japan, 1879.

C. palmata (palmate). A synonym of *Trautvetteria palmata.*

C. racemosa (racemose).* *fl.* white; racemes compound, very long. July and August. *l.* triternate, with serrated or, rather, cut leaflets. *h.* 3ft. to 5ft. North America, 1732. This species

Cimicifuga—*continued.*

resembles *Actæa spicata,* but is much larger. SYN. *Actæa racemosa* and *C. serpentaria.* (R. G. 443.)

C. serpentaria (snake-like). A synonym of *C. racemosa.*

CINCHONA (named after Countess de Chinchon, wife of a Governor of Peru, who was cured of a fever in 1638 by this remedy). Peruvian Bark. ORD. *Rubiaceæ.* South American trees, from which various kinds of Peruvian bark are obtained. Flowers white or reddish; inflorescence panicled. Leaves on stout petioles, with flat margins; stipules ovate or oblong, foliaceous, free, deciduous. These greenhouse evergreens are of the utmost importance, medicinally, and for this purpose their culture is of primary importance in India and many other tropical countries. They are rarely grown in this country, not being particularly ornamental. The best compost is a mixture of turfy loam and fibry peat, with a little sand and charcoal. Cuttings should be taken off when ripe, and planted in a pot of sand, which should be plunged, under a hand glass, in a moist heat.

C. Calisaya. Calisaya Bark. *fl.* pink. *l.* oval-oblong, shortly acuminate. *h.* 30ft. to 40ft. Andes of Peru.

C. lanceolata (lanceolate). A synonym of *C. officinalis.*

C. officinalis (officinal). *fl.* very pale rose-colour, supported on pedicels, which are powdered and silky, as well as the calyx; the tube of the corolla is silky, and the border white and woolly above; panicle bracteate, much branched, smooth. *l.* oval-lanceolate, acute, naked on both surfaces, as well as the branches, shining. *h.* 30ft. to 40ft. Peru. SYN. *C. lanceolata.*

Among other species of this genus are: *condaminea, cordifolia, microphylla, nitida,* and *scabra.*

CINCHONACEÆ. Included under *Rubiaceæ*

CINCINALIS. *See* **Nothochlæna.**

FIG. 453. FLOWERING BRANCH OF SINGLE-FLOWERED CINERARIA.

CINERARIA (from *cinerea,* ash-coloured; alluding to the grey down covering the surfaces of the leaves). ORD. *Compositæ.* An extensive genus of mostly herbaceous plants. Pappus pilose; receptacle naked; involucre campanulate, of many equal sides. Several of the hardy species are excellent plants for the herbaceous borders,

Cineraria—*continued.*

and may be easily grown in any ordinary garden soil. They may be propagated by divisions of the roots; or, better, by seed, sown in a cold frame or cool house, in spring. The florist's varieties which have originated from *C. cruenta* are among the most ornamental and useful plants that can be grown for greenhouse or conservatory decoration (see Fig. 453). As a packet of seed will produce a great variety of colours, including all shades of blue, and the plants are of tolerably easy culture, and do not require much heat, they should be grown by every one possessing a house where frost is excluded during winter. Named sorts must be propagated by division of the roots; but, as seedlings are more vigorous, and those of a good strain equal to many named kinds, the general plan is to sow in succession annually, and when the plants have flowered, throw them away. They are best grown in pits or frames, until frost sets in, and then removed to a light, airy position in the greenhouse, for winter blossoming.

FIG. 454. CINERARIA CRUENTA WEBBERIANA.

Seed should be sown under glass, those intended for autumn flowering in April and May, those for spring in July and August. Some light leaf mould should be sifted, and about an equal quantity of fresh sifted loam and sharp sand added; the whole being well mixed. After having drained the pans or pots, and placed some of the rough siftings over the crocks, fill up with fine soil, pressing tolerably firm, and afterwards finishing with a smooth surface on which to sow the seed. This should be scattered thinly and regularly over the surface, and very slightly covered with some more of the sifted mixture, afterwards watering it carefully with a fine-rosed can. The pans may be covered with sheets of glass, and placed in a shady position in the greenhouse or cold frame. The glass should be tilted when the young plants appear, and finally removed, to afford requisite light and air.

Cineraria—*continued.*

When the seedlings are large enough to handle, they should be placed separately in small pots, or pricked off in other pans. They should be kept rather close for a time after potting, to encourage root action, but must not be exposed to much heat at any time. The best place for them in summer is an ordinary garden frame, or cold pit, facing north. They delight in plenty of atmospheric moisture and a cool bottom, such as that afforded by a layer of coal ashes.

After Cultivation. As the plants progress, they should be shifted on in suitable sizes until placed in the flowering pots, as anything like starvation in the younger stages of growth is very detrimental to their well-being afterwards. Small decorative plants may be flowered in 5in. pots; but for larger specimens, those of 7in. or 8in. in diameter are required. The final shift must be determined at the outset, and the smaller-sized pots selected so as to give about an equal amount of soil each time. A much richer and rougher compost may now be employed, consisting of about half loam, with an addition of equal parts of leaf soil and tolerably dry cow manure. The plants must be again placed on ashes in a cool frame, and plenty of air admitted in mild weather, at the same time avoiding draughts, which are very injurious. Cinerarias like plenty of water at the roots at all times, and frequent syringings in summer and autumn. A thin shading will be required in bright weather, as the plants will not bear exposure to sun; it should not, however, be permanent, or sufficiently thick to exclude light. The plants soon become weak and drawn in a dry atmosphere, consequently only enough fire heat should be applied, even in winter, to exclude frost. The spring-sown plants will flower in autumn and early winter; but those sown in July or August, and grown on during winter, to flower the following spring, are invariably of the best quality. Named varieties that are to be perpetuated by cuttings, should be cut down after flowering, and be afterwards propagated by division.

FIG. 455. CINERARIA MARITIMA.

Insects, &c. Cinerarias are especially liable, in all stages of their growth, to the attacks of green fly. The frames should be fumigated frequently, but not strongly, with tobacco paper, as, although the fly may not be detected at first, the plants may be infested underneath the young leaves. Fumigation is a certain cure, but is best used as a preventive. Red spider is sometimes troublesome, but this is a sign of insufficient moisture, and the remedy is of course suggested. Mildew is often caused by draughts, or a confined, close atmosphere. The affected parts should be dusted with flowers of sulphur.

Cineraria—*continued.*

Double-flowered Cinerarias. These are similar in growth to the single varieties, but have their flowers quite double, like miniature rosettes. Seeds are not produced in anything like the quantity obtained from single ones, and the varieties cannot be depended upon to reproduce themselves true from seed. Neither will any more than a proportion of double-flowered plants be guaranteed. This entails the necessity of perpetuating any variety by cuttings, which is, with many of them, a very slow process. Although useful for buttonhole and other bouquets, and for cut-flower purposes, this section will probably never supersede the single-flowered one for beauty and general utility. All Cinerarias are benefited by applications of manure water, from the time the flower-heads are formed until they open.

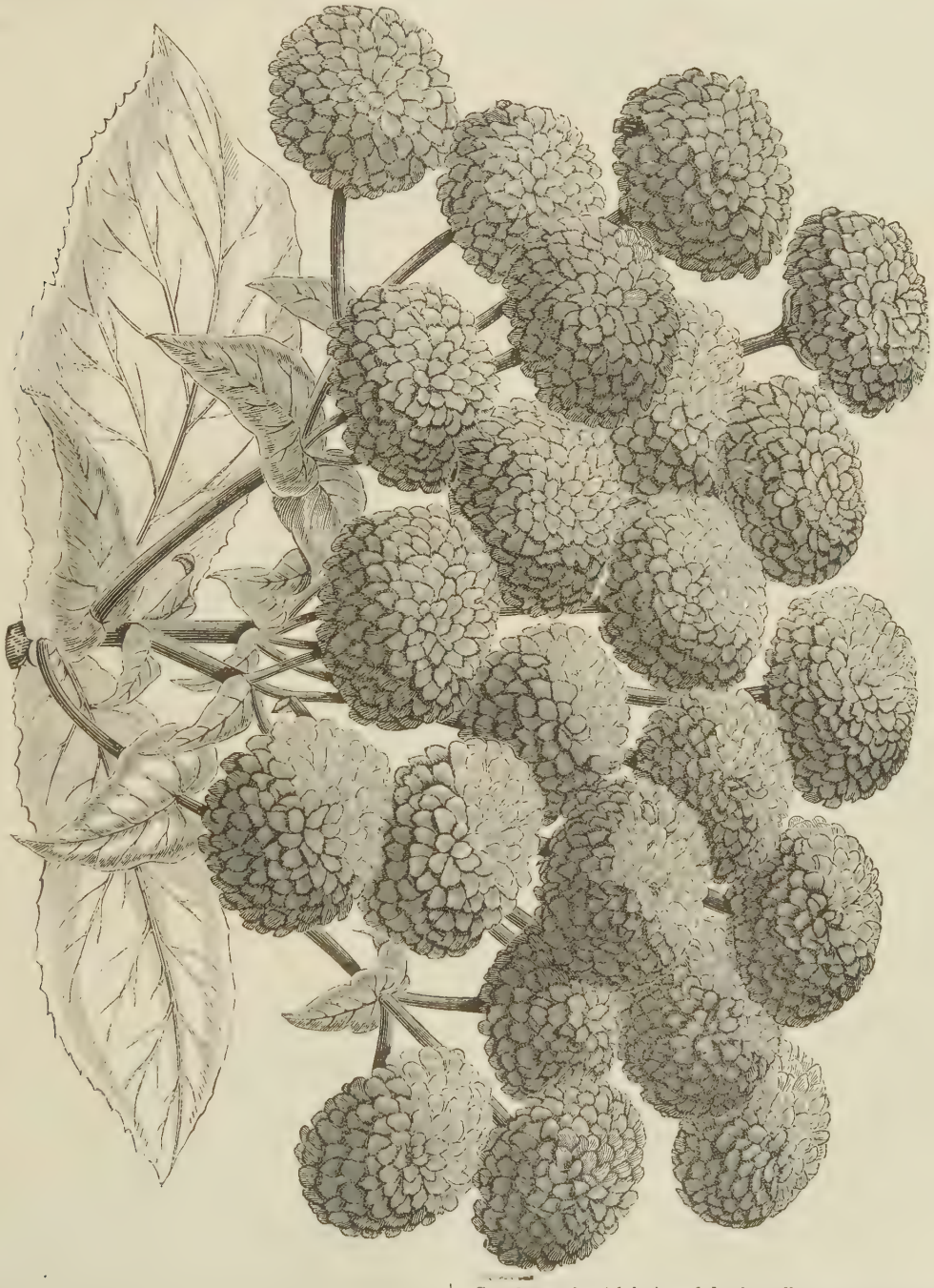


FIG. 456. FLOWERS OF DOUBLE CINERARIA MR. THOMAS LLOYD.

Cineraria—*continued.*

C. alpestris (alpine). *fl.-heads* yellow, corymbose. June. *l.* pinnate; terminal pinnæ large, cordate, cut-toothed; lateral ones cuneate, toothed at the end. *h.* 2ft. South and Eastern Europe, 1683. Hardy herbaceous perennial.

C. aurantiaca (orange-coloured).* *fl.-heads* orange, corymbose May. *l.*, radical ones elliptic, repandly toothed; stem ones

Cineraria—*continued.*

lanceolate, entire. Stem simple, rather woolly. South and Eastern Europe, 1819. Hardy perennial. (S. B. F. G. iii. 256.)

C. cruenta (purple-leaved).* *fl.-heads* reddish-purple, cymose. Spring and summer. *l.*, radical ones cordate lobed, purplish beneath; cauline ones sessile, ovate, auricled at base. *h.* 2ft. Canary Islands, 1777. Greenhouse perennial. (B. M. 406.)

C. c. Webberiana (Webber's). This is a garden hybrid, with bright blue flower-heads, raised in 1842. At the present time, it would be regarded as very inferior. The ray-florets are too narrow to allow it to be placed in a selection of florists' varieties, judged by the now accepted standard. See Fig. 454.

C. geifolia (Geum-leaved). *fl.-heads* yellow; peduncle branched. April to August. *l.* long-stalked, reniform, narrowed, somewhat lobed, downy; petioles auricled at end. *h.* 2ft. Cape of Good Hope, 1710. Greenhouse evergreen shrub.

C. lobata (lobed). *fl.-heads* yellow, sub-corymbose; involucre calyculate. June. *l.* roundish, many-lobed, smooth; petioles auricled at base. *h.* 3ft. Cape of Good Hope, 1774. Greenhouse evergreen.

C. longifolia (long-leaved). *fl.-heads* yellow, in corymbose umbels. July. *l.* somewhat toothed; radical ones spathulate; cauline ones oblong-lanceolate. Stem simple. *h.* 2ft. South and Eastern Europe, 1792. Hardy perennial.

C. maritima (sea).* *fl.-heads* yellow, panicled; involucre downy. July to September. *l.* pinnatifid; segments blunt, about three-lobed, silvery, downy beneath. *h.* 2ft. South Europe, 1633. Hardy evergreen. See Fig. 455. (S. F. G. 871.)

Varieties. The single varieties being so exclusively grown from mixed seed, it is hardly desirable to give a selection of named kinds. These are most important to the seed raiser only, to constitute and fix his strain. A list of the most desirable double-flowered kinds is appended:

ADA, deep blue, very full; KATE, pure white, tinted with pink, of excellent form; MARY, light magenta-rose; MR. THOMAS LLOYD, deep blue-purple, tipped with lake, very double and floriferous (see Fig. 456); ROSSINA, carmine, very double; SOPHIA, rich magenta, very large and full. Additional new ones are: ECLIPSE, JUNO, LILACINA, MR. R. H. VERTGANS, ROSETTA, ROSY GEM, ROYAL PURPLE, and STANSTEAD RIVAL.

CINEREOUS. Ash-coloured, grey.

CINNAMODENDRON (compounded from *Cinnamomum*, Cinnamon, and *dendron*, a tree; resembling a Cinnamon-tree). ORD. *Canellaceæ*.

C. corticosum (barky). *fl.* red. *h.* 50ft. West Indies, 1860. This is a stove tree, the bark of which is employed as an aromatic stimulant to purgatives and tonics. It requires cultivation similar to that recommended for *Canella*, to which the present genus is allied. (B. M. 6120.)

CINNAMOMUM (from *Kinnamomon*, the Greek name used by Theophrastus, from the Arabic name *Kinamon*). Cinnamon. ORD. *Laurineæ*. Stove evergreen trees, from some of which the Cassia and Cinnamon barks are obtained. They thrive in a compost of peat and loam. Cuttings of fine shoots will root, in April, if planted in sand, under a hand glass, and plunged in a moist bottom heat. This genus contains many species of great economic value; few of them are grown for any beauty which they may possess. Some of the species are: *aromaticus*, *Cassia* (Bastard Cinnamon), *Culilawan*, *dulce*, *Malabathrum*, *montanum*, *nitidum*, *obtusifolium*, and *verum*.

CINQUEFOIL. *See* **Potentilla.**

CIONIDIUM. *See* **Deparia.**

CIPURA (derivation unexplained). ORD. *Irideæ*. A very small genus of greenhouse bulbous plants. Flowers in terminal heads; perianth with a very short tube and a six-parted limb; inner segments much the smaller. Leaves ensiform. They thrive in a compost of sandy loam, peat, and leaf mould. It is desirable to keep them moderately dry through the winter, and to repot in spring. Propagated by seed, which should be sown in a slight heat, in spring; or by offsets, which are produced in abundance.

C. paludosa (marsh). *fl.* white, on a short, densely imbricated, terminal spike. July. *l.* radical, linear-lanceolate, plaited, 3in. to 5in. long, longer than the scape. Bulbs conico-globose. *h.* 1ft. Guiana, 1752. (B. M. 646, under the name of *Marica paludosa*.)

CIRCÆA (mythological name, after Circe, the famous enchantress). Enchanter's Nightshade. ORD. *Onagrarieæ*.

Circæa—*continued.*

Pretty herbaceous plants. Flowers in terminal and lateral racemes, covered with uncinate hairs. Leaves opposite, stalked, toothed. Roots creeping. They are of the easiest possible culture, and will grow under almost any conditions. Propagated readily by the running roots.

C. alpina (alpine). *fl.* pale red. July. *l.* cordate, toothed, shining, with winged petioles, membranous. Stems ascending, smoothish. *h.* 4in. to 6in. Northern hemisphere (Britain). (Sy. En. B. 512.) *C. intermedia* is a form of this species.

C. lutetiana (Parisian). *fl.* pale red. June. *l.* ovate, acuminated, toothed, opaque, and downy, longer than the petioles. Stem erect, pubescent. *h.* 1ft. to 1½ft. Northern hemisphere (Britain). (Sy. En. B. 511.)

CIRCINATE. Curled round like a crook; like the young fronds of ferns.

CIRRHÆA (the part of the flower called the rostellum is prolonged in the form of a small tendril or *cirrhus*). SYN. *Scleropteris*. ORD. *Orchideæ*. An interesting genus of stove Orchids (about six species are known), not remarkable for any particular beauty, and, consequently, rarely seen in cultivation. Flowers numerously produced on long, pendulous racemes, springing from the base of the pseudo-bulbs. When grown in pots, the spikes of these pretty, fragrant flowers hang down all round the sides, and present a very neat and effective appearance. For culture, *see* **Cymbidium.**

C. Loddigesii (Loddiges').* *fl.*, sepals greenish-yellow, striped across with dark red, and spotted; petals the same colour, without stripes; lip similarly coloured, but curiously formed. May. Brazil, 1827. (B. R. 1538.)

C. tristis (dull-coloured-flowered). *fl.*, sepals and petals dark-coloured, almost purple, tinged with blood-colour and greenish-yellow, very fragrant; lip purple. June. *h.* 9in. Mexico, 1834. (B. R. 1889.)

CIRRHIFEROUS. Bearing tendrils or claspers.

CIRRHOPETALUM (from *cirrhus*, a tendril, and *petalon*, a flower-leaf; in reference to the strap-shaped petals). SYN. *Ephippium*. ORD. *Orchideæ*. In this somewhat extensive genus (about thirty species are known, but few are in cultivation) we have both very beautiful and equally curious species. They are closely allied to *Bulbophyllum*, from which genus, however, they may be distinguished by having their lateral sepals very much lengthened out. It is this peculiar elongation which gives them their distinctive appearance and peculiar charm. They are stove epiphytes, with roundish pseudo-bulbs, from the top of which proceeds a single fleshy leaf. Cirrhopetalums should be grown in baskets, or upon blocks of wood, suspended from the roof, in such a situation that they can receive a goodly share of sun, air, and light. They enjoy a plentiful supply of water during the summer months, and, even during winter, anything like drying-off should be carefully avoided, although, as a matter of course, much less water will be required. In syringing, care must be taken to avoid sprinkling the blossoms. When the plants are in flower, they will need shading from the sun's rays.

C. auratum (gold-edged).* *fl.* straw-colour, stained and striped with crimson and gold; scape produced from the base of the pseudo-bulb, very slender, bearing a crown or circular umbel of delicate blossoms. Spring. *l.* solitary, oblong, convex, coriaceous, deep green above, but wholly purplish-red on the under side. Pseudo-bulbs small, oval. Manilla, 1840. Rare and elegant. (B. R. 29, 61.)

C. chinensis (Chinese). *fl.* large; upper sepals and petals purple; lateral sepals yellowish. China, 1840. A very curious species. (B. R. 29, 49.)

C. Cumingii (Cuming's).* *fl.* rich reddish-purple, produced in great profusion, at various times of the year, and disposed in large, regular, circular umbels; lateral sepals extremely peculiar, 1in. long, linear, oblong, acuminate, projecting forward, and having a peculiar twist at the base, which brings the outsides of these two sepals on the same plane, their inner edges meeting together, like the elytra, or wing cases, of some insects of the Buprestis kind. Philippines, 1839. A charming species, but still rare. (B. M. 4996.)

C. flagelliforme (whip-like). A synonym of *C. Pahudii*.

C. Medusæ (Medusa's).* *fl.* pale straw-coloured, dotted with pink, in dense heads, on an erect scape; two of the three sepals

Cirrhopetalum—*continued.*

lengthened into thread-like points, 4in. or 5in. in length. Summer. *l.* solitary, oblong, emarginate, coriaceous, deep green. Pseudo-bulbs ovate, somewhat four-angled. Singapore, 1839. (B. M. 4977.)

C. Pahudii (Pahud's). *fl.* reddish-brown, with bright red dots, disposed in a large umbel; sepals and petals turned back. *l.* dark green. Java, 1866. A very curious and interesting species. SYN. *C. flagelliforme.*

C. Thouarsii (Thouars's).* *fl.* produced in umbels on the apex of the slender scape; the long strap-shaped sepals are of a tawny orange colour, whilst the remainder of the flower is yellow, dotted with red. Summer. *l.* solitary, oblong, obtuse, dark green, coriaceous. Pseudo-bulbs smooth, produced from a creeping rhizome or stem. Java, Manilla, &c. (B. M. 4237.)

C. tripudians (dancing).* *fl.* brown, purplish-white, disposed in a nodding raceme of nine or ten blossoms. Burmah, 1876. This is described as a rather modest, but pretty, plant.

CIRRHOSE. Tendrilled; having tendrils or claspers, as the Pea.

CIRSIUM. *See* **Cnicus.**

CISSAMPELOS (from *Kissos*, the Greek name of Ivy, and *Ampelos*, a Vine; the plants resembling Ivy in their rambling habit, and the Vine in having the fruit in racemes). Pareira Brava Root. ORD. *Menispermaceæ.* Stove climbing shrubs. Racemes axillary; male ones often trichotomously branched, somewhat corymbose, solitary, twin or in threes, bearing many flowers at the top of the pedicels; female racemes simple, elongated, bearing broad alternate bracts. Leaves simple, stalked, orbicular, ovate, heart-shaped or peltate, mucronulate at the apex. These plants grow freely in fibrous loam. Cuttings root readily, with a hand glass placed over them, in heat. The majority of the species require a great deal of room to spread, before they arrive at a flowering stage.

C. mauritiana (Mauritian).* *fl.* yellow, green; male racemes axillary, in pairs or numerous. *l.* cordate-orbicular, pubescent-villous; those of the male plants peltate. Branches hispid. Mauritius, 1820.

C. Pareira (Pareira). Caapeba. *fl.* greenish; female racemes longer than the leaves. July. *l.* peltate, somewhat cordate, ovate-orbicular; under surface silky-pubescent. Branches smooth. Martinico, Jamaica, &c., 1733. (B. M. Pl. 15.)

There are about a score other species.

CISSUS (from *Kissos*, Ivy; in reference to the habit). ORD. *Ampelideæ.* This genus is now generally merged into *Vitis.* Climbing plants, with cymes or corymbs of small greenish, yellow, or purplish flowers, and simple, trifoliate, or palmate leaves.

As a roof climber, or bracket or trellis plant, *C. discolor* is universally admired. Two parts turfy peat, and one of loam and leaf mould, with a fair proportion of gritty sand, suits it well, either for basket or pot culture, or for planting out. Of course, in the latter case, the soil used will be coarser, and the drainage must be more ample. It thrives well in large pots; but for a fine growth over lofty roof girders or arches, or up pillars, it is best planted out. It luxuriates in bottom heat, displaying an unusual size and colour of leaf when growing freely in a surface temperature of 70deg., and a bottom heat of 80deg. Still, it also grows and colours well without bottom heat, and in the usual temperature of the plant stove. Propagation is easily effected by cuttings; more so in the spring than at any other season. There are, then, two modes of rooting. One consists in choosing the weakly shoots that are pruned just before the plants break into new growth. The other plan is even more successful: allow the young shoots to grow to a length of about 2in.; then cut them off, with a small piece of the base branch adhering to the young wood; or the shoots may be cut off with one or several of these young branchlets on them. Cut the old branch through at the base of each young one, and insert the cuttings with this heel of old wood entire. Very sandy soil or pure sand should be used for them. The cuttings should be plunged in a sharp bottom heat, in a close frame. They strike all the sooner if protected with bell glasses. Pot off so soon as rooted, and push on in a temperature of 70deg. to 80deg. When the plants are in full growth, and making long and

Cissus—*continued.*

strong shoots, they will be greatly benefited by the application of a little manure water. Great care must, however, be taken to use only a very weak solution; otherwise, instead of assisting the plants, it will prove very detrimental to them.

C. discolor (various-coloured).* *fl.* greenish-yellow; cymes somewhat quinquefid, shorter than the leaves. August. *l.* cordate-oblong, acuminated, the edges furnished with bristly serratures; upper surface of a bright velvety-green, spotted or mottled with white; under side of a deep reddish-purple; both surfaces, as well as the angular branches, smooth. Java, 1854. (B. M. 4763.)

C. porphyrophyllus (purple-leaved). A synonym of *Piper porphyrophylla.*

CISTERNS. These may be made of galvanised iron or slate, when required to be movable or only of a moderate size. As permanent reservoirs for water, Cisterns are generally constructed with stone or brick, and coated inside with cement. The superior value of rain water over any other for plant cultivation and garden purposes generally, is unfortunately often overlooked when building glass houses, as it is frequently conducted to drains when accommodation for its reception should be provided in the shape of Cisterns. These can be placed above or below ground, either inside or adjoining the houses, and, in addition, should be provided with means of supply from another source when rain water fails. An overflow pipe should be attached, and, if practicable, arranged so as to unscrew and open a passage at the bottom, to allow of the Cistern being cleaned out. Iron Cisterns require galvanising in all cases, as this prevents the iron causing rust or otherwise affecting the water. Almost all sizes may be purchased ready for use, and are well adapted for placing in houses where permanent ones are not constructed, so that water may stand and become warmed before being applied to the plants. Cold water is very injurious to plants growing in a warm temperature; hence the necessity for Cisterns of some sort, placed near or over hot-water pipes if possible, and kept filled with water ready for use. Where hard water has, of necessity, to be used for pot plants outside in summer, it may be materially softened by being placed in large open Cisterns, and exposed for a time to the air. Cisterns may also be used successfully for cultivating, on a small scale, tropical or hardy water plants. In connection with a heating apparatus, the cold-water Cistern should, in all cases, be placed at least a few feet above the highest point of the pipes it has to supply. The size of Cistern for this purpose is immaterial, the important part being to keep it filled with water.

CISTINEÆ. An order of often viscid shrubs or herbaceous plants. Flowers showy, with five, or rarely three, petals, which are very fugacious, usually lasting only a day. Leaves entire, simple. The two best-known genera are *Cistus* and *Helianthemum.*

CISTUS (from *kiste*, a box or capsule; alluding to the remarkable shape of the capsules). Gum Cistus; Rock Rose. ORD. *Cistineæ.* Elegant erect shrubs or sub-shrubs. Flowers large, handsome, resembling a *single* Rose, but ephemeral in character; peduncles axillary, one or many-flowered. Leaves opposite, exstipulate, entire, or somewhat toothed. Without exception, this genus is a most charming one, and ought to be represented in every garden; but, unfortunately, the species will only thrive happily in warm, sheltered positions. The texture of the flowers is very delicate; their colours are distinct and rich, and they are borne with great profusion during summer. In cold localities, they should be planted at the foot of a wall with a southern aspect. Propagation may be effected by seeds or cuttings, under hand glasses outside, or inside with a gentle bottom heat; but seedlings always make the best plants. The seeds should be sown early in spring, in pans or boxes, in a frame, and lightly covered with sifted sandy mould. The seedlings will come up without

Cistus—*continued.*

artificial heat in about six weeks. When the plants are somewhat advanced, they should be gradually hardened off. Great care must, however, be taken to shade them from too much sunshine, and to keep them regularly watered. When they are about 1in. high, they may be transferred to small pots; this shift enables them to be placed in a frame to re-establish. A few plants should be kept in the frame during the winter, and removed out of doors in spring, when the weather becomes mild and genial. In all cases, a slight protection from frost will reduce the chances of their being destroyed by an extra severe winter. Cuttings should be made from 3in. to 4in. in length; they may be struck in spring or autumn, in sandy peat, under glass, shade and water being given until roots are formed. The plants should then be potted off singly into a compost of rich loam and leaf mould, and finally planted out; but it is always advisable to reserve duplicates in pots for winter protection, so as to be able to replace in the event of loss.

Many of the names here given simply represent varying forms of a few species. As, however, they are distinct for gardening purposes, they are mentioned under the names by which they are known in horticultural works.

FIG. 457. FLOWERING BRANCH OF CISTUS LADANIFERUS MACULATUS.

C. albidus (white).* *fl.* three to eight, terminal, somewhat umbellate; petals pale purple, yellow at the base, imbricate. June. *l.* sessile, oblong-elliptical, hoary-tomentose, somewhat three-nerved. *h.* 2ft. South-western Europe, 1640. (S. C. 31.)

C. candidissimus (whitest). *fl.* pale rose-coloured; peduncles one to eight-flowered, shorter than the leaves. June. *l.* ovate-elliptical, acute, densely clothed with hoary tomentum, three-nerved; footstalks short and sheathing at the base, with pilose margins. *h.* 4ft. Grand Canary Islands, 1817. SYN. *Rhodocistus Berthelotianus.* (S. C. 3.)

C. Clusii (Clusius's). *fl.* white, somewhat capitate. July. *l.* somewhat three-nerved, linear, with revolute margins; under surface canescent; bracts pilose, broadly ovate, acuminate, ciliate, caducous, rather longer than the peduncles. *h.* 2ft. Spain and Portugal, 1810. (S. C. 32.)

C. creticus (Cretan). *fl.*, petals purple, yellow at the base, imbricate; sepals villous; peduncles one-flowered. June. *l.* spathulate-ovate, tomentosely-hairy, wrinkled, drawn out along the short footstalk, and waved on the margin. *h.* 2ft. Crete, 1731. (S. F. G. 495.) This, and some other species in the Levant, yield labdanum, a resin which was largely used as a medicine during the prevalence of the Plague. It is collected by whipping the plants with long thongs attached to a rake-like frame, the resin

Cistus—*continued.*

adhering to the straps. At the present time, it is principally used as a perfume in Turkey.

C. crispus (curled).* *fl.* almost sessile, three or four together, somewhat umbellate; petals red-purple. June. *l.* sessile, linear-lanceolate, undulately-curled, three-nerved, wrinkled, pubescent. *h.* 2ft. South-western Europe, 1656. (S. C. 22.)

C. Cupanianus (Cupani's). *fl.* white, with a spot of yellow at the base of each petal; peduncles pilose, two to three-flowered; petals imbricated; sepals villous. June. *l.* stalked, cordate-ovate, wrinkled, reticulately-veined; upper surface scabrous; under surface covered with fascicled hairs; margin fringed. Stem erect. *h.* 2ft. Sicily. (S. C. 70.)

C. cyprius (Cyprus). *fl.*, petals white, with a dark spot at the base, imbricated; peduncles generally many-flowered. June. *l.* stalked, oblong-lanceolate; upper surface glabrous; under surface clothed with hoary tomentum. *h.* 4ft. Cyprus, 1800. (S. C. 39.)

C. formosus. *See* **Helianthemum formosum.**

C. heterophyllus (various-leaved).* *fl.*, corolla red, yellow at the base, large; petals imbricate; peduncles hairy, leafy, one-flowered, one to three together. June. *l.* ovate-lanceolate, on short footstalks, which are sheathing at the base; margins revolute. *h.* 2ft. Algiers. (S. C. 6.)

C. hirsutus (hairy).* *fl.*, petals white, with a yellow mark at the base of each, imbricate; peduncles short, one-flowered, or cymose, many-flowered. June. *l.* sessile, oblong, blunt and hairy. *h.* 2ft. South-west Europe, 1656. (S. C. 19.)

C. incanus (hoary). A synonym of *C. villosus.*

C. ladaniferus (labdanum-bearing).* Gum Cistus. *fl.* white, large, terminal, solitary; petals imbricate. June. *l.* almost sessile, connate at the base, linear-lanceolate, three-nerved; upper surface glabrous; under surface tomentose. *h.* 4ft. Spain, 1629. (S. C. 84.) At one time, it was believed that this species furnished the labdanum of commerce.

C. l. maculatus (spotted).* *fl.*, petals white, each marked near the base with a dark blood-coloured spot. See Fig. 457. (S. C. 1.)

C. latifolius (broad-leaved).* *fl.*, petals white, with a yellow spot at the base of each, imbricated; sepals villous; peduncles bracteate, long, somewhat cymose, pilose. May. *l.* stalked, broad, cordate, acute, with curled, waved, denticulated, ciliated margins. *h.* 3ft. Barbary, 1656. (S. C. 15.)

C. laurifolius (Laurel-leaved). *fl.* white, with a yellow mark at the base of each petal, large, umbellate. June. *l.* stalked, ovate-lanceolate, three-nerved; upper surface glabrous; under surface tomentose; footstalks dilated and connate at the base. *h.* 4ft. South-west Europe, 1731. (S. C. 52.)

C. laxus (loose).* *fl.* white, with a yellow spot at the base of each petal, cymose; peduncles and calyx hairy. July. *l.* on short footstalks, ovate-lanceolate, acuminated, with wavy, somewhat toothed margins, smoothish; upper ones hairy. *h.* 3ft. South Europe, 1656. (S. C. 12.)

C. longifolius (long-leaved).* *fl.* white, with a yellow mark at the base of each petal; peduncles cymose. June. *l.* on short footstalks, oblong-lanceolate, with waved and pubescent margins; under surface veiny. Spain and South of France, 1800.

C. monspeliensis (Montpelier).* *fl.* white, middle-sized; petals imbricate, crenate; peduncles pilose, cymose, somewhat secund. July. *l.* linear-lanceolate, sessile, three-nerved, clammy, villous on both surfaces. *h.* 4ft. South Europe, 1656. (S. C. 27.)

C. m. florentinus (Florentine).* *fl.*, petals white, yellow at the base, imbricate; peduncles villous, generally three-flowered. June. *l.* narrow-lanceolate, wrinkled, reticulated on the under surface; almost sessile. *h.* 3ft. Italy, 1825. A hybrid between *monspeliensis* and *salvifolius.* (S. C. 59.)

C. oblongifolius (oblong-leaved).* *fl.* white, with a yellow spot at the base of each, concave, imbricated; peduncles cymose. June. *l.* on short footstalks, oblong-lanceolate, obtuse, pubescent and waved at the margins; under surface veiny. Branches hispid-villous. *h.* 4ft. Spain. (S. C. 67.)

C. obtusifolius (blunt-leaved).* *fl.*, petals white, with a yellow spot at the base of each, imbricated; peduncles terminal, cymose, many-flowered. June. *l.* almost sessile, tapering to the base, ovate-oblong, obtuse, wrinkled, clothed with starry pubescence; margins somewhat denticulated. *h.* 1ft. to 1½ft. Crete. (S. C. 42.)

C. populifolius (Poplar-leaved). *fl.* white, cymose; sepals clammy; peduncles bracteate, bracts oblong. May to June. *l.* stalked, cordate, acuminate, wrinkled, smooth. *h.* 3ft. South-western Europe, 1656. (S. C. 23.)

C. psilosepalus (smooth-sepaled).* *fl.* somewhat cymose; peduncles hairy-tomentose; sepals with long points, glabrous, shining, edges ciliated; petals broad-cuneated, imbricated, white, with a yellow mark at the base of each. June to August. *l.* on short footstalks, oblong-lanceolate, three-nerved, acute, with undulated margins, which are somewhat denticulated and ciliated, rather hairy. *h.* 2ft. to 3ft. Native country unknown. (S. C. 33.)

C. purpureus (purple).* *fl.*, petals reddish-purple, marked at the base with a dark purple spot, imbricate; peduncles one, two, or three together. June. *l.* oblong-lanceolate, acuminated at both ends, wrinkled; footstalks short, hairy, sheathing. *h.* 2ft. Levant. (S. C. 17.)

Cistus Magnolense

Cistus—*continued.*

C. rotundifolius (round-leaved).* *fl.*, petals purple, with a yellow mark at the base of each, imbricate; sepals cordate, pilose; peduncles very hairy, rather cymose. June to September. *l.* roundish-ovate, obtuse, flat, wrinkled, reticulately veined, clothed on both sides with fascicled hairs; petioles furrowed, somewhat sheathing at the base. *h.* 1ft. South Europe, 1640. (S. C. 75.)

C. salvifolius (Sage-leaved). *fl.* white, middle-sized; peduncles long, white from tomentum, one-flowered, articulated above, solitary or tern. June to August. *l.* stalked, ovate, obtuse, wrinkled; under surface tomentose. *h.* 2ft. South Europe, 1548. (S. C. 54.) There are many varieties of this species.

C. s. Corbariensis (Corbar).* *fl.*, petals white, imbricate; peduncles long, one to five-flowered. May. *l.* stalked, somewhat cordate, ovate, acuminated, with fringed margins, wrinkled on both surfaces, and very glutinous. *h.* 2ft. South of France, 1656. A hybrid between *salvifolius* and *populifolius*. (S. C. 8.)

C. undulatus (waved). A synonym of *C. villosus*.

C. vaginatus (sheathed).* *fl.* rich rose; petals imbricate; peduncles three-flowered, axillary or terminal, long, bracteate at the base. April to June. *l.* lanceolate, acute, three-nerved, hairy; under surface reticulated; footstalks furrowed, dilated, and sheathing at the base, with pilose margins. *h.* 2ft. Teneriffe, 1779. (S. C. 9.)

C. villosus (villose).* *fl.*, petals large, reddish-purple, spreading, imbricate at the base; peduncles one-flowered, one or three together. June. *l.* roundish-ovate, wrinkled, tomentose and hairy, stalked; footstalks furrowed, connate at the base. *h.* 3ft. South Europe, 1596. SYNS. *C. incanus* and *C. undulatus*. (S. C. 35.)

Citrullus—*continued.*

in diameter, sometimes much smaller, sweet or bitter. *l.* deeply divided, or but moderately lobed, glabrous or somewhat hairy,

FIG. 459. WATER MELON (CITRULLUS VULGARIS).

hardly scabrid. India. "Said to be annual, while *C. Colocynthis* is perennial; but the distinction between the cultivated form of *C. Colocynthis* and the divided-leaved forms of the Water Melon.

FIG. 458. CITRULLUS VULGARIS, showing Habit of Plant, and (*a*) Male and (*b*) Female Blossoms.

C. v. canescens (hoary).* *fl.*, petals crenulated, of a darkish-purple, tinged with blue, and with a yellow spot at the base of each; sepals clothed with starry pubescence; peduncles terminal, one-flowered, or somewhat cymose. May. *l.* oblong-linear, bluntish, tomentose, hoary, waved, rather three-nerved, sessile, and somewhat connate at the base. *h.* 2ft. South Europe. (S. C. 45.)

CITHAREXYLUM (from *kithara*, a lyre, and *xylon*, wood; in reference to the fitness of the wood for musical instruments). Fiddle-wood. Including *Rauwolfia* (of Ruiz and Pavon). ORD. *Verbenaceæ*. A genus of about a score rather ornamental stove evergreen trees. Probably very few are now grown. They have principally white flowers, and in height range from 6ft. to 50ft. Some of the species which have been introduced are: *caudatum*, *cyanocarpum*, *dentatum*, *quadrangulare*, *subserratum*, and *villosum*.

CITRON. *See* **Citrus medica.**

CITRULLUS (from *Citrus*, in allusion to the Orange-like fruits). ORD. *Cucurbitaceæ*. A small genus of stove herbs, closely allied to *Cucumis*. Flowers unisexual, with a persistent five-parted calyx and corolla. Fruit a many-seeded gourd. For culture, &c., *see* **Cucumis.**

C. Colocynthis (Colocynth, the classical name of the plant). Bitter Apple; Bitter Cucumber. *fl.* light yellow, solitary. *fr.* globose, rarely 3in. in diameter, intensely bitter, smooth, variegated green and white. *l.* deeply divided, 2½in. by scarcely 2in., ovate; middle segment compound-pinnatifid. Whole plant scabrid. India. Perennial. (B. M. Pl. 114.) SYN. *Cucumis Colocynthis*.

C. vulgaris (common).* Water Melon. *fl.* yellow. *fr.* often 10in. is very small." SYNS. *Cucumis* and *Cucurbita Citrullus*. See Figs. 458 and 459.

FIG. 460. FRUITING BRANCH OF SWEET ORANGE (CITRUS AURANTIUM).

FIG. 461. FRUITING BRANCH OF SHADDOCK (CITRUS DECUMANA).

CITRUS (from the Greek name, *Kitron*). **Orange-tree.** ORD. *Rutaceæ*. Greenhouse evergreen trees or shrubs, having axillary spines and simple leaves, with their petioles usually winged. Flowers white, exquisitely fragrant. Some plants of the *Citrus* family are found in most gardens. The flowers are produced at all seasons, and are much used for wedding bouquets. The leaves are of a glossy green colour; and even the non-flowering plants have a fine appearance. The soil used when cultivating in pots or tubs should be a moderately heavy loam, to which a liberal portion of decayed manure and sand has been added. During the growing season, some liquid manure should be regularly supplied; but, as soon as growth declines, this should be gradually stopped. A moist atmosphere should be kept up during the season of growth, as one approaching drought causes the plants to have a starved and stunted appearance. In potting, the soil should be rammed firmly, or the wood will be too soft and sappy to ripen properly. If grown in a greenhouse, the heat must not be less than 45deg. in winter; and in summer, of course, it will vary, the ordinary temperature, with plenty of air at all times, being suitable. Propagation may be effected by seed, cuttings, layers, grafting and budding. The object of raising plants from seed is to obtain stocks for grafting or budding. The seedlings should be raised on a hotbed; in the course of six weeks, they will be fit to plant separately into pots, after which they must be replaced in the hotbed, and shaded for some time, but afterwards allowed plenty of air, in order to harden them. In August of the next year, they will be sufficiently strong for budding; after the operation has been performed, they should be placed under a hand glass. In the course of a month, it will be observable whether the buds have taken; they must then be untied, and allowed to remain in the greenhouse all the winter. In spring, cut off the heads of the stocks, 3in. above the buds, again place them in a moderate hotbed, and by the end of July they will have made shoots 2ft. long. Then harden them off before the cold sets in, by gradual exposure to the air. Of most of the following species there are a great number of varieties, more or less distinct.

For cultivation of *Citrus* as a dessert fruit, *see* **Orange.**

FIG. 462. FRUITING BRANCH OF KUMQUAT (CITRUS JAPONICA).

Citrus—*continued.*

C. Aurantium (golden).* Sweet Orange. *fr.* golden, globose, with a thin rind and sweet pulp. *l.* ovate-oblong, acuminate; petioles almost naked. *h.* 10ft. to 30ft. Asia, 1595. See Fig. 460. (B. M. Pl. 51.)

C. decumana (huge). Shaddock. *fr.* very large and round, about the size of a cannon-ball, often 10lb. to 14lb. weight; rind even, of a greenish-yellow colour, thick, fungous, and bitter. *l.* oval, obtuse, or emarginate, pubescent beneath; petioles with broad cordate wings; branches prickly. *h.* 18ft. Assumed to have been derived from Polynesia; now naturalised in many tropical countries. 1722. See Fig. 461.

C. japonica (Japanese). Kumquat. *fr.* globose or shortly ellipsoid, bright orange-yellow, four to six-celled; rind thick, minutely tuberculate; pulp watery, sweet, and acidulous. *h.* 4ft. to 6ft. A cultivated form, from China and Japan. Mr. Fortune—who introduced it—gives the following hints as to its cultivation. In summer, it requires a plentiful supply of water, at a temperature of 80deg. or 100deg. and a high atmospheric heat continued into autumn, whilst in winter it should be kept cool and rather dry, for it will then bear 10deg. and even 15deg. of frost. It succeeds well grafted on *Citrus trifoliata*. The Kumquat is a well-known ingredient in Chinese sweetmeats. See Fig. 462.

C. Limetta (Lime).* Sweet Lime, or Lemon Bergamotte. *fr.* globose, with a blunt, nipple-like protuberance at the apex, a firm rind, and sweet pulp. *l.* ovate-roundish, serrated; petioles subulate. *h.* 8ft. to 15ft. Asia, 1648. Adam's Apple is a name sometimes given to the fruit of this species.

C. Limonum.* Lemon. *fr.* oblong, with a very thin yellow rind, which adheres to the acid pulp. *l.* oval-oblong, crenulated; petioles somewhat winged. *h.* 8ft. to 10ft. Asia, 1648. (B. M. Pl. 54.)

FIG. 463. FRUITING BRANCH OF CITRON, or CEDRAT (CITRUS MEDICA).

C. medica ("the fruits of the Citron were called *Mala medica*, or *Mala persica*, by the Romans, from the country of their origin").* Citron, or Cedrat. *fr.* often 6in. long, ovate, with a protuberance at the tip; usually nine-celled; pulp white, and commonly acid; rind yellow, thick, hardish, odoriferous, irregular; esculent, both raw and preserved. *l.* oblong, obtuse; petioles naked. Branches spiny. *h.* 8ft. to 16ft. Asia, 1648. See Fig. 463.

C. m. acida (acid). The cultivated West Indian Lime. This is a variety of *C. medica*, with smaller globose fruit. It is the

Citrus—*continued.*

principal source whence citric acid is obtained, and is largely grown in the West Indies, especially in Montserrat and Dominica. (B. M. 6745.)

FIG. 464. FRUITING BRANCH OF MANDARIN ORANGE (CITRUS NOBILIS).

C. nobilis (noble).* Mandarin Orange. *fr.* reddish, both without and within, containing sweet juice, and having edible sweet rind; depressed, nine to twelve-celled. *l.* somewhat ovate; petioles rather linear, straight. Branches ascending, unarmed. *h.* 15ft. China, 1805. See Fig. 464. (A. B. R. 608.)

C. trifoliata (three-leaved). *fr.* orange-yellow, spherical, about 1½in. in diameter. *l.* trifoliate; leaflets sessile, elliptic-obtuse, on a winged petiole. Branches robust, often more or less flattened, bearing stiff spines. *h.* 4ft. Japan. Hardy. SYN. *Pseudægle sepiaria*. (B. M. 6513.)

C. vulgaris (common). Common Seville or Bitter Orange. *fr.* globose, with a thin, scabrous, or smooth rind, and a bitter acrid pulp. *l.* elliptical, acuminate, crenulated; petioles with a heart-shaped wing. Stem erect; branches spiny. *h.* 20ft. to 30ft. Asia, 1595.

CIVES. *See* **Chives.**

CLADRASTIS (derivation obscure). ORD. *Leguminosæ*. A small genus, containing but a couple of species of hardy deciduous trees. They succeed in almost any soil or situation. Propagated by imported seed, sown in the open air, in spring; or by cuttings of the roots. (It is only during hot seasons that seeds are ripened in this country.)

C. amurensis (Amoor).* *fl.* greenish-white, small, disposed in long, dense, erect racemes. *l.* unequally pinnate, with three to four pairs of ovate-oblong leaflets. *h.* 6ft. Amoor Valley, 1880. Very ornamental. SYN. *Maackia amurensis*. (B. M. 6551.)

C. tinctoria (dyers'). *fl.* white, drooping from the ends of the branches in ample panicled racemes. May. *l.* nearly smooth, pinnate; leaflets from seven to eleven, oval or ovate. North America. SYN. *Virgilia lutea*.

CLAMMY. Viscid, sticky.

CLARKIA (named after Captain Clarke, the companion of Capt. Lewis, in his journey to the Rocky Mountains of North America). ORD. *Onagrarieæ*. Elegant slender branching annuals. Flowers axillary, sessile, solitary; petals four, cruciate, usually three-lobed, convolute in æstivation. Leaves alternate, lanceolate, or linear, entire. These charming flowers are very largely grown in gardens, on account of their extreme showiness and easy culture. Seeds may be sown in spring or autumn, out of doors. When the plants are in their flowering quarters, a distance of 9in. to 12in. apart should be allowed.

C. elegans (elegant).* *fl.* of a rich lake colour; petals entire, without teeth or the claw. Summer. *l.* lanceolate, dentate. *h.* 2ft. California, 1832. (B. R. 1575.) There are many forms of this species, including white, rose, and double-flowered varieties, many

Clarkia—*continued.*

of which are very desirable, and may be easily procured at any dealer's.

C. guaroides (Guara-like). A synonym of *C. rhomboidea.*

FIG. 465. FLOWERING BRANCH AND SINGLE FLOWER OF CLARKIA PULCHELLA.

C. pulchella (pretty).* *fl.* purple, large; petals deeply trilobed, with a pair of small opposite teeth on the claws. Summer. *l.* glabrescent, linear. *h.* 1½ft. to 2ft. North America, 1826. See Fig. 465. (B. R. 1100.) This species also has many single and double-flowered varieties, more or less beautiful, which are fully described in seedsmen's catalogues.

C. rhomboidea (rhomboid) is a species with smaller purplish flowers than either of the preceding. SYN. *C. guaroides.* (S. B. F. G. 379.)

CLARY (*Salvia Sclarea*). The leaves of this are sometimes used in soups. The culture is very simple. Seeds may be sown in early spring, in a warm sunny border, and the plants ultimately thinned out to 18in. apart. An annual sowing is necessary, as the plants die after the seed ripens.

CLAUSENA (commemorative of P. Clausön, a Danish botanist of the seventeenth century). ORD. *Rutaceæ.* A genus of about fourteen species of stove evergreen trees, occurring for the most part in India, a few being found in Africa and tropical Australia. Flowers small, disposed in loose panicles. Leaves impari-pinnate; leaflets stalked, pubescent. They thrive in rich loam; young cuttings, ripened at the bottom, and taken off at a joint, will root in sand, under a hand glass, in heat.

C. corymbiflora (corymb-flowered). *fl.* white. Loyalty Islands, 1878.

C. pentaphylla (five-leaved). *fl.* white. June to August. *l.* with five or seven pairs of leaflets. *h.* 20ft. India, 1800.

CLAVATE. Club-shaped; the thick end uppermost.

CLAVIJA (named after J. Clavijo Faxardo, a Spanish naturalist, who translated Buffon's works into Spanish). SYN. *Theophrasta* (of Linnæus, not of Jussieu). ORD. *Myrsineæ.* A genus of stove evergreen trees or shrubs. Stems simple, unbranched, furnished at top with a tuft of long, alternate, oblong-lanceolate, coriaceous, spiny-toothed or quite entire leaves, somewhat in the manner of palm-trees. Flowers in axillary or lateral racemes, often secund. There are about twenty-five species, all natives of tropical America, &c. They thrive in a compost of peat and loam. Cuttings of half-ripened shoots will root in sandy loam, with a surface consisting wholly of sand, if placed in bottom heat, under a bell glass.

Clavija—*continued.*

C. fulgens (brilliant).* *fl.* deep orange-red, very handsome; racemes short, axillary. *l.* obcuneately spathulate, 1ft. or more long. Stem simple, bearing a crown of leaves. Peru, 1867. (B. M. 5626.)

C. macrocarpa (large-fruited). *fl.* rather large; racemes from 3in. to 12in. long, pendulous. *l.* spathulate-oblong, acute, stiff, dotted beneath; petioles hardly 1in. long. *h.* 10ft. to 12ft. Peru, 1816.

C. macrophylla (large-leaved). A synonym of *C. Reideliana.*

C. ornata (adorned).* *fl.* orange-coloured; racemes drooping, 3in. to 4in. long. *l.* long-lanceolate, acute, spiny-toothed; petioles 2½in. long. *h.* 10ft. to 12ft. Caraccas, 1828. SYN. *Theophrasta longifolia.* (B. M. 4922.)

C. Reideliana (Reidel's).* *fl.* orange-coloured; racemes axillary, from amongst and beneath the crown of leaves. July. *l.* sessile obovate-lanceolate, spinosely-serrate; larger ones 12in. to 20in. long. Brazil. SYN. *C. macrophylla.* (B. M. 5829.)

Other two species are: *Rodekiana* and *umbrosa.*

CLAW. The unguis or stalk of a petal; the narrow end.

CLAY-COLOURED VINE WEEVIL. *See* **Vine Weevils.**

CLAYTONIA (named after John Clayton; he collected plants, mostly in Virginia, and sent them to Gronovius, who published them in his "Flora Virginica"). ORD. *Portulaceæ.* A genus of delicate little glabrous, rather succulent, hardy annuals or perennials. Racemes terminal. Leaves quite entire; radical ones petiolate, upper usually opposite and sessile, and sometimes connate. Claytonias are of easy culture, and suited for certain parts of the rockery or wild garden. The tuberous-rooted species thrive best in damp peat soil. They may be increased by seeds, which sometimes ripen freely; or by offsets, which may be separated in spring or autumn. The fibrous-rooted species being annuals, the seeds only require to be sown in the open border in spring, in a rather moist situation.

C. caroliniana (Carolina). *l.* spathulate-oblong or oval-lanceolate. North America. (S. B. F. G. 208.)

C. grandiflora (large-flowered). Synonymous with *C. virginica.*

C. perfoliata (perfoliate). *fl.* white, small; lower pedicels of raceme in bundles. May to August. *l.*, upper ones connate or perfoliate, forming a roundish disk; radical ones petiolate, oval-rhomboid. Root fibrous. *h.* 3in. to 6in. North-west America to Mexico and Cuba, 1794. Annual. This species is naturalised in many parts of Britain and other countries. (B. M. 1335.)

FIG. 466. CLAYTONIA SIBIRICA, showing Habit and Single Flower.

C. sibirica (Siberian).* *fl.* rose-coloured; petals bifid; raceme secund. March. *l.* oval; radical ones petiolate; cauline ones two, opposite, sessile. Root fusiform. *h.* 3in. to 6in. Siberia, 1768. Perennial. See Fig. 466. (B. M. 2243.)

C. virginica (Virginian).* *fl.* white; petals emarginate; pedicels elongated; raceme solitary, nodding. March. *l.* linear-lanceolate, elongated; radical ones very few. *h.* 3in. Roots tuberous. North America, 1768. Perennial. SYN. *C. grandiflora.* (B. M. 941.)

CLEFT. Divided, but not exactly to the base.

CLEISOSTOMA (from *kleio*, to close, and *stoma*, a mouth; in allusion to the mouth of the spur being closed by a toothed process). ORD. *Orchideæ*. Stove epiphytes. Flowers small, fleshy, with a pouched lip, and distinguished from those of *Saccolabium* in having the orifice of the pouch closed by a large projecting tooth. Leaves leathery, narrow. Roots very long and tough. There are about fifteen species belonging to this genus, but, with one or two exceptions, they are not much grown. For culture, *see* **Aerides.**

C. Dawsoniana (Dawson's).* *fl.* sulphur-coloured outside, darker inside, with elegant transverse brown bars; stellate, of a thickish substance; lip quinquefid, orange-yellow, with some brown blotches and streaks; disk covered with many golden hairs; column small, with two falcate penicillate ears. The inflorescence has a sword-shaped rachis; the branches bicarinate, and bearing the flowers in an alternating way; bracts very dry, triangular, carinate, shining brown. *l.* distichous, light green, about 6in. long. Moulmein, 1868. A very gay and pretty species.

C. striatum (striate). *fl.* yellow, red. Darjeeling, 1879. SYN. *Echioglossum striatum.*

CLEMATIS (from *klema*, a Vine branch; most of the species climb like the Vine). Virgin's Bower. ORD. *Ranunculaceæ*. A genus of climbing deciduous shrubs or herbaceous perennials. Calyx of from four to eight coloured sepals; petals none. Carpels numerous, aggregate, terminated by a long, mostly feathery, tail. Leaves opposite, variously cut. For climbing up stumps of old trees, training to trellises on walls, or planting to droop over amongst rockwork, no plants are more suitable, or will make a more gorgeous display, than many of the large-flowered Clematises. Their habit and character alone are suggestive of the many ornamental purposes to which they may be put, and there are few places which may not be adorned by them in some way or other. Not only are they well adapted for running up all kinds of supports, but many of the grand hybrid varieties are equally suitable for trailing over the surface of the ground, and covering beds, either alone or associated with a few distinct foliage plants, such as *Negundo fraxinifolium variegatum*, with which they look well, and produce a charming effect.

General Cultivation. To get the Clematis to flower well and continuously in dry weather, it must have a good depth of rich loamy soil, and a fair share of manure, both above and below the surface. Liquid manure is also a great help to free flowering, and therefore good soakings of it should be given from time to time, according to the state of the weather. As Clematises are always kept in pots for sale, the month of June is a favourable one to obtain them and plant out; but before doing this, suitable preparations should be made, by deeply trenching the ground, which, if at all stiff, will be greatly improved by having plenty of leaf soil, refuse peat, or other rich vegetable matter, worked in, together with some road scrapings or trimmings, which will keep the whole open and allow the roots to ramify freely. When required for borders, the best way of growing Clematis is to dig large holes, about 3ft. across and 2ft. deep, and either fill in with fresh turfy loam and dung, or add a good proportion of the same to the soil thrown out, before it is put back. Place one or more plants in the centre of each hole, and also three tall stakes, triangularly, for the plants to climb up, which they will do with very little assistance after they have had a tie or two and made a fair start. These stakes should be driven in firmly, about 2ft. apart, and then brought together at the tops, and secured by running a piece of wire round them, so that the three, when fixed, form a graduated cone, the shape and outline of which is always the most pleasing of any kind of trellis or support that can be used. The *lanuginosa* types are best adapted for planting to train on verandahs or up trellises on dwellings, where, if well fed, and otherwise left pretty much to themselves, they soon cover a large space and produce an immense number of flowers. Different growers of Clematises vary much in their manner of treating them. Some, instead of thinning or simply shortening back the shoots during the winter,

Clematis—*continued.*

adopt the more severe proceeding of cutting away the whole of the tops, so as to force the plants to break again from the crowns. This method answers for *Jackmanni*, and the strong-growing series of which it is the type. It is, however, not to be recommended in the case of those of the *lanuginosa* type, which generally die back quite far enough, and only require that such dead portions should be cut away, as to do anything further only weakens them, by restricting their growth. Neither is this treatment desirable with any of the others, except such as are confined to beds and have only limited spaces to fill. Heading back those used for covering old trunks of trees, gnarled poles, or other similar supports, lays the latter bare for a long time in spring and early summer, when they would be covered with verdure. It also retards the period of flowering.

Propagation is mainly effected by grafting any of the varieties on portions of Clematis roots, early in the year. Good healthy pieces of root, obtained from old plants outside, or those of *C. Flammula*, answer the purpose well.

FIG. 467. FLOWERING BRANCH OF CLEMATIS AROMATICA.

These should be split open, and the small scions inserted and tied with matting; they should then be potted in thimble pots, and placed in a propagating case, with a warm, moist temperature, where they will readily unite. They may afterwards be removed to cooler quarters, and be ultimately plunged outside.

All the different varieties of Clematis may also be readily increased, either by cuttings, made of the young shoots, which may be cut up to every eye, and placed in pots of sandy soil, in gentle heat, in the propagating case; or by layers outside, put in at any time. Layers will, in the course of a year, if kept watered, be found to emit roots at the joints covered, after which they may be severed and planted, just before growth commences, in the spring. To aid them in rooting, it is a good plan to slightly scrape the bark before laying the branches in.

Clematis—*continued.*

Clematises may be easily increased, if required, by seed. The seed vessels should be gathered towards the autumn, and stored in some dry, cool place till the following spring, when the seed they contain may be sown in light sandy soil, and stood in gentle heat till they germinate. If then nursed on for a time under glass, and afterwards planted in deep rich loam, the plants will soon flower. The varieties being now so numerous, and brought to such perfection by systematic crossing, it is hardly to be expected that many improved forms are to be obtained by ordinary cultivators, by merely raising them from seed.

For greenhouse or conservatory decoration, the tenderer sorts are extremely useful. A house having a temperature of 40deg. to 50deg. is the best; and, whether grown in pots or trained on the roof or back wall, the plants prove equally ornamental. With the general exception of a few degrees of higher temperature, the culture of the greenhouse species does not materially differ from that of the hardy sorts.

C. æthusifolia (Æthusa-leaved). *fl.* white, between cylindric and campanulate, ¼in. to ⅜in. long. *l.* small, two to three pinnatisect, with narrow linear lobes. *h.* 4ft. to 6ft. Hardy.

C. æ. latisecta (broadly-cut) only differs from type in the larger leaf segments, which are as broad as long, and irregularly toothed. Amur-land and North China. A very graceful hardy climber. (B. M. 6542.)

C. aristata (awned). *fl.* greenish-yellow, diœcious, panicled; sepals four. May to August. *l.* ternate; leaflets ovate, somewhat cordate, acute, coarsely toothed. Australia, 1812. Greenhouse. (B. R. 238.)

C. aromatica (aromatic).* *fl.* deep violet-blue, sweetly-scented, terminal, solitary; sepals oblong-lanceolate, three-nerved, reflexed after flowers have thoroughly expanded. Summer. *l.*, leaflets five, shortly stalked or almost sessile, entire, broadly ovate, or ovate-oblong, dark green above, paler beneath. *h.* 4ft. to 6ft. Native country unknown. A sub-shrubby perennial. SYN. *C. cærulea odorata.* See Fig. 467.

C. azurea grandiflora (large-flowered blue). A synonym of *C. cærulea.*

C. balearica (Balearic). *fl.* pale, pubescent on the outside, and marked on the inside with oblong red spots, about 2in. across; peduncles one-flowered, with an involucre under the flower. February, March. *l.* ternate; leaflets stalked, three-lobed, deeply toothed. Minorca, 1783. Greenhouse; hardy in South of England. SYN. *C. calycina.* (B. M. 959.)

FIG. 468. FLOWERING BRANCH OF CLEMATIS CÆRULEA.

C. cærulea (sky-blue).* *fl.* violet-coloured, with deep purple stamens, large; sepals six to eight, oblong-lanceolate, acute, membranaceous. June and July. *l.* spreading, hairy, ternate; leaflets ovate-acute, entire. Japan, 1836. Hardy. SYN. *C. azurea grandiflora.* See Fig 468. (B. R. 1955.) There are several forms of this species, amongst which are: *Amalia*, pale violet; *monstrosa*, remarkable for its semi-double greenish flowers; *patens*, white; and *Sophia*, having very large and unusually broad sepals, of a deep violet, with a longitudinal greenish band through the centre.

C. c. odorata (sweet-scented). A synonym of *C. aromatica.*

C. calycina (calycine). A synonym of *C. balearica.*

Clematis —*continued.*

C. campaniflora (bell-flowered). *fl.* of a purplish-white colour, large, half open; sepals half spreading, dilated at the apex, wavy; peduncles one-flowered, somewhat longer than the leaves. June. *l.* biternately decompound; leaflets entire or three-lobed, about twenty-four in number. Portugal, 1810. Hardy. (L. B. C. 937.)

C. caripensis (Caripan).* *fl.* white, sweet-scented, panicled, diœcious; pedicels and bracts pubescent. August. *l.* pinnate; leaflets ovate, acuminated, five-nerved, quite entire, smooth. Cumana, near Caripa, 1820. Stove.

C. chlorantha (green-flowered). A synonym of *C. grandiflora.*

FIG. 469. FLOWERS AND LEAVES OF CLEMATIS CIRRHOSA.

C. cirrhosa (tendrilled).* *fl.* pale whitish or cream-coloured, downy on the outside, but smooth inside; peduncles one-flowered, with an involucre. March. *l.* ovate, somewhat cordate, toothed, in fascicles. South Europe, 1596. Hardy evergreen. See Fig. 469. (B. M. 1070.)

C. crispa (curled).* *fl.* pale lilac or purple, nodding; sepals firm, constricted above the middle; margins wavy, reflexed and spreading at the apex; peduncles one-flowered, shorter than the leaves. July to September. *l.* entire, three-lobed or ternate, very acute. North America, 1726. Hardy evergreen. SYNS. *C. cylindrica* and *C. Simsii.* (B. M. 1892.)

C. cylindrica (cylindrical). A synonym of *C. crispa.*

C. erecta (erect). A synonym of *C. recta.*

C. Flammula (flame).* *fl.* pure white, fragrant; peduncles simple or branched. July to October. *l.* pinnate, smooth, with orbicular, oval, oblong or linear, entire or three-lobed, acutish leaflets. South Europe, 1596. A very vigorous climber, and one of the oldest in cultivation. There are several forms, which vary slightly from the type.

C. florida (florid).* *fl.* pale white, large, spreading; sepals six or eight, oval-lanceolate, much pointed; peduncles one-flowered, longer than the leaves. April to September. *l.* ternately decompound; leaflets ovate, acute, quite entire. Japan, 1776. Hardy. (B. M. 834.) The charming double-flowered form is much commoner in our gardens than the normal type.

FIG. 470. FLOWER AND LEAVES OF CLEMATIS FORTUNEI.

Clematis—*continued.*

C. Fortunei (Fortune's).* *fl.* white, fragrant, about 1in. across, and consisting of about a hundred oblong-lanceolate stalked floral leaves. *l.* coriaceous, usually trifoliolate; leaflets cordate, rounded at the apex. Japan, 1863. A splendid hardy species, of which there are two or three varieties. See Fig. 470. (G. C. 1863, 676.)

C. grandiflora (large-flowered).* *fl.* greenish-yellow, campanulate, very large; peduncles one to three-flowered, shorter than the leaves. February to May. *l.* pinnate, smooth; leaflets five, ovate, cordate, acuminated, coarsely serrated. Sierra Leone, 1823. Stove or warm greenhouse. SYN. *C. chlorantha.* (B. R. 1234.)

C. graveolens (strong-smelling).* *fl.* pale yellow, medium-sized, solitary. Summer. *l.* pinnately three to five foliolate; leaflets narrow, three-lobed. Chinese Tartary, 1844. A small, hardy, climbing shrub. (B. M. 4495.)

C. grewiæflora (Grewia-flowered). *fl.* of a tawny-yellow colour. about 1½in. long, campanulate. *l.* ovate, covered with rusty down, Himalayas, 1868. A distinct-looking cool greenhouse species. (B. M. 6369.)

C. indivisa (simple).* *fl.* white, cream, panicled. April. *l.* ternate; leaflets ovate, quite entire, mucronate, coriaceous, smooth. New Zealand, 1847. Half-hardy. *C. i. lobata* is a form of this, with lobed leaflets, but is otherwise like the type. (B. M. 4398.)

C. integrifolia (entire-leaved). *fl.* nodding; sepals blue, coriaceous, younger ones with villous edges, adult ones with wavy edges; peduncles terminal, one-flowered. June to August. *l.* entire, ovate-lanceolate, smooth; the two upper ones are concave and connivent before flowering, hence they inclose the flower as if it were in a bladder. *h.* 2ft. Eastern Europe, 1596. (B. M. 65.) There are two or more varieties of this hardy species.

FIG. 471. FLOWERS AND LEAVES OF CLEMATIS VIORNA.

C. lanuginosa (woolly).* *fl.* solitary, very large, 6in. to 7in. across, formed of six or eight spreading sepals. Early summer. *l.* usually simple, broadly cordate, acute, glabrous above and hairy beneath. China, 1851. Hardy. (F. d. S. 8, 811.) The variety *pallida* has flowers from 9in. to 10in. across.

C. montana (mountain).* *fl.* white, large, resembling in size and form those of *Anemone sylvestris*; peduncles usually one-flowered. Early summer. *l.* ternate or trifid, smooth; leaflets oblong, acuminated, rather toothed at the base, lateral ones almost sessile. *h.* 20ft. Nepaul, 1831. Hardy in most places. (G. C. 1872, p. 1424.)

C. ochroleuca (yellowish-white). *fl.* erect, or a little inclined, cream-coloured, and yellow on the outside; peduncles one-flowered. July. *l.* entire, ovate; younger ones silky. Stem erect. *h.* 1ft. to 2ft. East United States, 1767. Hardy perennial. (L. B. C. 661.)

C. orientalis (Eastern). *fl.* greenish-yellow, with a tinge of russet on the upper part and outside, sweet-scented, panicled. August. *l.* pinnate; leaflets smooth, wedge-shaped, with three toothed pointed lobes. *h.* 8ft. Orient, 1731. Half-hardy.

C. paniculata (panicled).* *fl.* white, sweet-scented, resembling those of *C. Flammula*; pedicels panicled, many-flowered. July, August. *l.* pinnate; leaflets ovate-cordate, acute, entire. Japan, 1796. Hardy.

C. Pitcheri (Pitcher's). *fl.* dull purplish, bell-shaped; sepals with narrow and slightly margined, recurved points; tails of the fruit filiform and barely pubescent. July to August. *l.*, leaflets three to nine, ovate or cordate, entire or three-lobed; uppermost leaves often simple. United States. A hardy climber.

C. recta (erect).* *fl.* white, sweet-scented; sepals oval; corymbs densely flowered. June to August. *l.* pinnate; leaflets stalked, ovate, acuminated, quite entire. Stem erect. *h.* 2ft. to 3ft.

Clematis—*continued.*

South and East Europe, 1597. Herbaceous perennial. SYN. *C. erecta.*

C. Simsii (Sims's). A synonym of *C. crispa.*

C. smilacifolia (Smilax-leaved.) *fl.*, sepals four, linear-oblong, clothed with rusty tomentum on the outside, but smooth and purple on the inside; panicles axillary, few-flowered, rather shorter than the leaves. *l.* ovate-cordate, smooth, entire. Nepaul, 1823. Greenhouse. (B. M. 4259.)

C. tubulosa (tubular).* *fl.* blue, with a long slender tube, of a deeper colour than the spreading limb, in shape very much resembling the flower of a common Hyacinth. Autumn. *l.* broad, with three broadly oval-rounded leaflets. Stem erect, almost woody. *h.* 2ft. to 3ft. China, 1845. Hardy. (B. M. 4269.) *C. Davidiana* (David's), a blue-flowered sort, from the same country, whence it was introduced in 1863, is closely allied to this species. (R. H. 1867, 90.)

FIG. 472. FLOWERS AND FRUIT OF CLEMATIS VITALBA.

C. verticillaris (verticillate). Synonymous with *Atragene americana.*

C. Viorna. Viorna; Leather-flower. *fl.* purple, yellow inside, large, drooping; sepals connivent, thick, acuminated, reflexed at the apex; peduncles one-flowered. June. *l.* smooth, pinnate; leaflets entire, three-lobed, or ternate, ovate, acute, floral ones entire. *h.* 10ft. to 12ft. North America, 1730. Hardy. See Fig. 471.

C. V. coccinea (scarlet).* *fl.* solitary, axillary, or at the extremities of the branches on long coloured peduncles; sepals four, very thick and fleshy, about 1½in. long, campanulate at the base; segments reflexed at the tip; interior yellow, exterior of an intense vermilion. Texas, 1868. A slender-growing but very elegant species, reaching about 5ft. or 6ft. in height. Probably hardy. In some books, this has been named *C. Pitcheri*, a widely different species. (B. M. 6594.)

FIG. 473. FLOWERING BRANCH OF CLEMATIS VITICELLA.

Clematis —*continued.*

C. virginiana (Virginian).* *fl.* white, fragrant, small, panicled, dioecious. June to August. *l.* ternate; leaflets cordate, acute, grossly toothed or lobed. *h.* 15ft. to 20ft. North America, 1767. Hardy. (W. D. B. 74.)

C. Vitalba (White Vine).* Old Man's Beard; Traveller's Joy, &c. *fl.* white, with a sweet almond scent; peduncles forked, shorter than the leaves. July to September. Seed or carpels furnished with a feathery tail. *l.* pinnate; leaflets ovate-lanceolate, acuminated, cordate at the base, partly cut. Europe (Britain), Western Asia. Hardy. See Fig. 472.

C. Viticella.* Vine Bower. *fl.* blue, purple, or rose-coloured, large, drooping; sepals obovate, spreading; peduncles one-flowered, longer than the leaves. June to September. *l.* entire or ternately decompound; lobes or leaflets entire. South Europe and Western Asia, 1569. Hardy. See Fig. 473. (B. M. 565.) There are several varieties of this species, one of which is double.

In "The Clematis as a Garden Flower," by Thos. Moore, F.L.S., and George Jackman, F.R.H.S., the following key to the various classes is given:

CLIMBING PLANTS.

Flowering on the Year-old Ripened Wood.

Flowers medium-sized (winter and spring blossomers)	§ 1. *montana* type.
Flowers large—	
Spring blossomers	§ 2. *patens* type.
Summer blossomers	§ 3. *florida* type.
Flowering from the Young Growing Summer Wood.	
Flowers small (late summer blossomers)	§ 4. *graveolens* type.
Flowers large (summer and autumn blossomers)	
Flowers successional, dispersed	§ 5. *lanuginosa* type.
Flowers successional, massed	§ 6. *Viticella* type.
Flowers profusely massed, continuous	§ 7. *Jackmanni* type.

NON-CLIMBING PLANTS.

With sub-shrubby stems	§ 8. *cærulea odorata* [*aromatica*] type.
With herbaceous stems	§ 9. *erecta* [*recta*] type.

It will be seen from this key to the classes, that the latter are numerous, and variable in habit and time of flowering. This difference must be borne in mind with each under cultivation, as it affects the manner of pruning considerably. To prune or remove the ripened wood of the three types first named, in winter, would, of course, destroy the flowers of the following year. The next four types make their growth and flower on it annually, consequently a little thinning out of the weaker shoots in early spring might prove of advantage by encouraging the stronger ones. Many varieties of these types have their shoots killed in winter by frost, being more tender, as a rule, than the three first-named. The last two types are quite distinct, being, as stated, non-climbing plants.

Varieties. Of late years, this magnificent genus of plants has been greatly improved by hybridisation. This very successful method of obtaining new kinds is believed (according to the authority already quoted) to have been first practised by Isaac Anderson-Henry, Esq., of Edinburgh, who was shortly afterwards followed by Mr. George Jackman, of Woking, Surrey. *C. Jackmanni* was one of the latter gentleman's first seedlings, and it is still one of the best and most useful we have. It flowered about the year 1862. Many other hybridisers, in this country and on the Continent, have since been at work with the different species and the hybrids afterwards obtained, to produce the very large and varied collection we now possess. We select a list, which is being constantly augmented, of the most approved varieties at the present time.

ALBERT VICTOR, deep lavender, the centre of each petal banded with brown, changing to white (May and June); ALEXANDRA, flowers pale reddish-violet; AMALIA, white, straw-coloured in centre, stamens reddish-purple (May and June); COUNTESS OF LOVELACE, large double-flowered variety, of rich purplish colour, the best double known; DEVONIENSIS, flowers the brightest and most delicate azure, large and well-formed, robust, hardy, and a free blossomer; DUCHESS OF EDINBURGH, fine double white, very large; DUKE OF EDINBURGH, rich violet-purple, very large; EARL OF BEACONSFIELD, royal purple, a magnificent variety; ENCHANTRESS, white, very double, the exterior petals flushed with rose; FAIR ROSAMOND, bluish-white, with a somewhat indistinct wine-red bar up the centre of each sepal, the stamens very prominent and distinct, exceedingly fragrant; FAIRY QUEEN, pale flesh, with a red bar in the centre of each petal; GEM, deep lavender-blue, very fine; GIPSY QUEEN, dark velvety-purple, very floriferous; GRAND DUCHESS, blush-white, very large and free; GUIDING STAR, purple, shaded crimson, a maroon band down each petal; HELENE, white, straw-coloured centre (May and June); HENRYI, large, of fine form, creamy-white, very free; HYBRIDA SPLENDIDA, rich violet, stems green (July to October); JACKMANNI, flowers large, deep violet-purple, rugose and veiny in centre, stamens green (July to October); JOHN GOULD VEITCH, flowers large and double, light blue (summer flowering); LADY BOVILL, flowers large, cupped, greyish-blue, suffused with mauve; LADY CAROLINE NEVILLE, bluish-white, with a broad bar in the centre of each petal; LADY LONDESBOROUGH, delicate silvery-grey, white stripe down each petal, stamens stained with pink (May and June); LILACINA FLORIBUNDA, pale lilac, very free; LORD LONDESBOROUGH, rich mauve, striped maroon, very large; LOUISA, mauve, shaded with pink (May and June); LOUIS VAN HOUTTE, rich blue-purple, very large and distinct; LUCIE LEMOINE, the largest and best double white; MADAME GRANGE, purplish-violet, red bar; MADAME VAN HOUTTE, pure white, fine shape and substance; MARIE LEFEBVRE, very fragrant; MISS BATEMAN, pure white, creamy band down each petal; MRS. JAMES BATEMAN, pale lavender, very handsome (May and June); OTHELLO, dark velvety-purple, fine form; OTTO FROEBEL, white, shaded with azure-blue, large; PRINCE OF WALES, deep violet-purple, petals barred with red (July to October); REGINÆ, flowers large, rich deep mauve in colour; SENSATION, rich satiny-mauve, large and very fragrant; SIEBOLDII, pale straw, centre puce, shaded with green (July to October); SOPHIE, mauve petals, pale straw in the centre, stamens chocolate (May and June); SOPHIE FLORE-PLENO, flowers double, mauve, outer petals pale yellowish-white (May and June); STANDISHII, flowers large, violet-blue (May and June); STAR OF INDIA, reddish-purple, with purple bands; STELLA, flowers light violet or deep mauve, with a distinct bar of deep reddish-brown or plum-colour in the centre of each sepal, delicately scented; SYLPH, white, shaded with light pinkish-mauve; SYMEIANA, pale mauve, flowers large; THOMAS MOORE, rich soft violet, stamens white; TUNBRIDGENSIS, dark blue, shaded with purple; VENUS VICTRIX, delicate lavender, an excellent form; VESTA, fine white, early flowering.

CLEMATITIS. *See* **Aristolochia Clematitis.**

FIG. 474. FLOWERING BRANCH OF CLEOME PUNGENS.

CLEOME (name adopted by Linnæus from Theodosius). Spider Flower. Including *Peritoma* and *Polanisia*. ORD. *Capparideæ*. A large genus, comprising about seventy species, mostly annual herbs—a few are shrubby. Flowers white, yellow, or purple, showy, solitary or racemose. Leaves simple, or digitately three to seven-foliate.

Cleome—*continued.*

They should be raised from seeds in spring, in a frame, with slight warmth, potted off singly, and hardened subsequently, so as to be planted out in May, when they should be vigorous plants. Cleomes thrive best in light rich soil, in a dry, warm situation, where they have plenty of room to spread. The stove shrubby species also require a light rich soil, and ripened cuttings root readily under a hand glass, in moderate heat; but as they produce seed freely, this will be unnecessary. The stove annuals are of easy culture.

C. arborea (tree-like). *fl.* white. June. *l.*, leaflets seven, with about twenty veins on each. *h.* 6ft. to 8ft. Caraccas, 1817. Stove shrub, velvety-pubescent, somewhat clammy.

C. gigantea (gigantic).* *fl.* whitish-green, with pinkish filaments and yellow anthers. June. *l.* seven-foliolate, with thirty to forty veins on each leaflet. Plant velvety-pubescent, somewhat clammy. *h.* 6ft. to 12ft. South America, 1774. This is a beautiful stove shrub, but has a strong disagreeable smell, and a caustic taste. (B. M. 3137.)

C. pungens (pungent).* *fl.* white, flesh-coloured, or rose, with purplish stamens and brownish anthers. July. *l.* prickly, covered with clammy hairs, with five to seven leaflets; bracts simple, cordate, or ovate. *h.* 1ft. to 3ft. West Indies, &c., 1817. Stove annual. SYN. *C. spinosa*. See Fig. 474. (B. M. 1640.)

C. rosea (rose).* *fl.* beautiful rose-coloured. June. *l.*, leaflets quinate; lower and floral ones ternate; uppermost ones ovate, sessile. Stem erect, branched. *h.* 1½ft. Rio Janeiro, 1824. An unarmed, smooth, stove biennial. (B. R. 960.)

C. speciosissima (showiest). *fl.* beautiful rose-coloured. July. *l.*, leaflets five to seven, lanceolate, acuminate, pilose. *h.* 1½ft. Mexico, 1829. An unarmed hardy annual. (B. R. 1312.)

C. spinosa (prickly). Synonymous with *C. pungens*.

CLERODENDRON (from *kleros*, chance, and *dendron*, a tree; said to be owing to the uncertainty of the medicinal qualities). SYNS. *Ovieda*, *Siphonantha*, *Volkameria*, and *Volkmannia*. ORD. *Verbenaceæ*. A genus containing about seventy species of mostly stove or greenhouse ornamental plants, having terminal panicles of brightly coloured pentamerous flowers, with exserted stamens and style; and simple leaves. These are among the best of stove plants, and in habit of growth present two sections, one with a climbing habit, and the other shrubby. A mixture of equal parts peat and loam, with the addition of a little leaf mould or decomposed manure, and some charcoal or sand, suits the climbing ones admirably. The shrubby sorts have more gross foliage, and need something stronger to enable them to throw up their large panicles of rich scarlet and other coloured flowers. They should be cut close back soon after flowering, and be kept somewhat dry during the winter, in a temperature of about 55deg. Propagation is very easily effected. Cuttings of the shrubby sorts, put in when the plants are cut down, root readily. Pieces of the stem, or side branches, from 3in. to 6in. or more in length, should be inserted in sandy soil, watered, and then plunged in a bottom heat of 70deg. Clerodendrons may also be propagated by seed, which, if sown when ripe, or in the spring, and grown on in heat, may be converted into flowering plants the second season. The climbing varieties do not root quite so readily from cuttings as the other section; but cuttings of the ripened wood, when the plants are pruned after flowering, should be put in sandy soil, and covered with a bell glass.

Clerodendrons are subject to mealy bug, but not more so than many other stove plants. The best cure for this pest is constant attention by hand-pickings, and washing with soft soap water or an insecticide. By such means, it may be readily kept in check, though rarely absolutely destroyed. Aphides sometimes attack the young and tender shoots; these may be destroyed, as soon as detected, by fumigating, two evenings in succession — not too strongly, or injury may be caused.

As the plants shed their leaves, little or no water will be needed during winter, but they should not be kept in too low a temperature. In January or February, they should be started in a brisk heat. When those in pots have grown a few inches, they should be shaken out,

Clerodendron—*continued.*

and potted in fresh soil. If they can be plunged in bottom heat for a time, they will thrive all the better and grow faster. Of course, climbing Clerodendrons, planted out in the stove, cannot be removed into a lower temperature; but the stove may be kept cooler in winter—say, a minimum temperature of 60deg.—and, as the wood has grown so near the glass, it will generally be sufficiently ripened to flower well the succeeding season. *C. Thomsonæ* is one of the most distinct and useful of stove climbers, and is also a good exhibition plant when well grown in a large pot. *C. fallax* is one of the best shrubby species.

C. Bethuneanum (Capt. Bethune's).* *fl.* crimson, with a white spot on the upper, and a purple one on the two lateral lobes; panicles large, terminal, pyramidal; bracts, pedicels and calyces all coloured. *l.* large, cordate-acuminate, smooth above. *h.* 10ft. Borneo, 1847. Stove shrub. (B. M. 4435.)

C. Bungei (Bunge's). A synonym of *C. fœtidum*.

C. calamitosum (calamitous). *fl.* white. August. *h.* 4ft. India, 1823. Stove. (B. M. 5294.)

C. fallax (deceptive). *fl.* bright scarlet; panicles terminal, erect, many-flowered. August and September. *l.* large, cordate-ovate, slightly lobed, dark green. Java. An erect-growing stove shrub.

C. fœtidum (fœtid).* *fl.* lilac-rose, in dense terminal corymbs. August. *l.* large, pubescent, cordate-acuminate, toothed, on slender petioles. *h.* 5ft China, 1820. A handsome greenhouse or nearly hardy shrub, armed with short rigid prickles. SYN. *C. Bungei*. (B. M. 4820.)

C. fragrans (fragrant).* *fl.* white; corymb terminal, hemispherical, compact. August to December. *l.* sub-cordate, serrate, pubescent, with two glands at the base. *h.* 6ft. China, 1790. Greenhouse. (B. M. 1834.)

C. f. flore-pleno (double-flowered).* *fl.* white, suffused with pink, very fragrant, disposed in compact heads. October. *l.* roundish-ovate or obovate, quite entire. *h.* 6ft. China, 1790. Greenhouse shrub.

C. hastatum (spear-leaved). *fl.* white, very fragrant, produced in a large panicle. June. *l.* large, halbert-shaped. *h.* 6ft. India, 1825. Stove shrub. (B. M. 3398.)

C. infortunatum (unfortunate). *fl.* vivid scarlet, large, disposed in coloured panicles. *l.* roundish-cordate, glossy dark green. *h.* 6ft. Ceylon. Stove shrub, very ornamental when in flower. (B. R. 30, 19.)

C. myricoides (Myrica-like). *fl.* white, blue, disposed in fascicled axillary cymes. Spring. *l.* oblong-lanceolate or obovate, toothed. Tropical Africa. A dwarf stove shrub. SYN. *Cyclonema myricoides*.

FIG. 475. CLERODENDRON SQUAMATUM, showing Flowering Branch and Single Flower.

C. paniculatum (panicled). *fl.* scarlet, disposed in a large pyramidal terminal panicle. August. *l.* large, long-stalked, cordate-hastate, lobed at the margin, and somewhat shiny above. *h.* 6ft. Java, 1809. A very handsome stove shrub. (B. R. 406.)

C. scandens (climbing).* *fl.* white; corymbs many, axillary, and terminal. August. *l.* cordate-ovate, acuminate, entire. Plant downy; stems tetragonal, scandent. Guinea, 1822. Stove. (B. M. 4354.)

C. serotinum (late). *fl.* pure white, sweet-scented, produced in large corymbose panicles, 1ft. or more across; calyx rose-coloured, angular. *l.* cordate, decussate. *h.* 10ft. China, 1867.

Clerodendron *continued.*

A much-branched greenhouse or half-hardy shrub. (R. H. 1867, 351.)

C. Siphonanthus (siphon-flowered). Tube Flower. *fl.* white. *h.* 6ft. India, 1796. Stove. SYN. *Siphonanthus indica.*

C. speciosum (showy).* *fl.* rich deep rose; calyx large, suffused with red. *l.* oblong-ovate, glabrous. A very ornamental climbing hybrid. (I. H. 593.)

C. splendens (splendid).* *fl.* scarlet; panicle terminal, corymbose. June, July. *l.* oblong, wavy, acuminated, rather cordate at base Sierra Leone, 1839. Stove climber. (B. R. 28, 7.)

C. s. speciosissima (showiest).* *fl.* bright scarlet, disposed in panicles. Summer. *l.* somewhat oblong, of a deep shining green. A very handsome form of the foregoing species, and one of the best stove climbers grown.

C. squamatum (scaled).* *fl.* bright scarlet, produced in large coloured branching panicles. Summer. *l.* roundish-cordate. *h.* 10ft. China, 1790. A very fine stove shrub. See Fig. 475. (B. R. 8, 649.)

C. Thomsonæ (Mrs. Thomson's).* *fl.* bright crimson, disposed in large panicles; calyces pure white. *l.* ovate, acuminate, smooth, dark green, opposite. *h.* 12ft. Old Calabar, 1861. On account of the brilliant colour of its flowers, and the freedom with which they are produced, this is the most widely grown stove climber of the genus. (B. M. 5313.)

C. trichotomum (three-forked). *fl.*, calyx red, inflated; corolla white; cymes loose, terminal, long-stalked, trichotomously-branched. September. *l.* stalked, ovate, tapering at both ends, serrate. *h.* 6ft. Japan, 1800. A very handsome hardy shrub. (B. M. 6561.)

C. viscosum (clammy). *fl.* white, with flesh-coloured centre; calyx large, five-cornered, viscid; segments of corolla nearly equal, the uppermost a little the largest, irregularly disposed, looking all upwards, leaving a wide space between two of them. May to August. *l.* cordate, toothed. Somewhat downy. *h.* 6ft. India, 1796. (B. M. 1805.)

CLETHRA (from *Klethra*, the Greek name of the Alder; in allusion to the resemblance in the leaves). ORD. *Ericaceæ.* Very ornamental deciduous greenhouse or hardy shrubs or trees. Flowers bracteate; corolla so deeply five-parted as to appear made up of five free petals. Racemes terminal, solitary, or paniculate. The hardy species thrive best in loam and sandy peat, without dung. From their dwarf and neat habit, they are well adapted for growing in the front of shrubberies, where the proper soil is present. They are usually increased by layers, put down in autumn; but cuttings root readily at the same season, in sandy soil, under a hand glass. The greenhouse species are very suitable for large conservatories, for which purpose few plants are more beautiful than *C. arborea*; they thrive in the soil above recommended, and cuttings taken from half-ripened wood will root freely in gentle heat. All may be raised from seed, which, in most of the species, ripen in abundance.

C. acuminata (taper-pointed).* *fl.* white, fragrant; racemes spicate, almost solitary, bracteate, clothed with white tomentum. July to October. *l.* oval, acuminated, bluntish at the base, serrated, glabrous on both surfaces, rather glaucous beneath. *h.* 10ft. to 15ft. Carolina, 1806. Hardy shrub.

C. alnifolia (Alder-leaved).* *fl.* white; racemes spicate, simple, bracteate, clothed with hoary tomentum. July to September. *l.* cuneate-obovate, acute, coarsely serrated above, glabrous on both surfaces, and of the same colour. *h.* 3ft. to 4ft. United States, 1731. Hardy shrub. (G. W. P. A. 22.)

C. arborea (tree). *fl.* white; racemes spike-formed, panicled at the tops of the branches. August to October. *l.* oblong, attenuated, lanceolate, glabrous on both surfaces, serrated. *h.* 8ft. to 10ft. Madeira, 1784. Greenhouse tree. (B. M. 1057.) There are two varieties of this species, one a smaller kind, and the other with variegated leaves.

C. paniculata (panicled).* *fl.* white, fragrant; panicle terminal, elongated, composed of racemes, and clothed with white tomentum. July to October. *l.* narrow, cuneate-lanceolate, acute, acuminately serrated, glabrous on both surfaces. *h.* 3ft. to 4ft. Carolina, 1770. Hardy shrub.

C. scabra (rough). *fl.* white; racemes spicate, sub-panicled, bracteated, finely tomentose. July to October. *l.* broad, cuneate-obovate, acute, scabrous on both surfaces, coarsely serrated; serratures hooked. *h.* 3ft. to 4ft. Georgia, 1806. Hardy shrub.

C. tinifolia (Tinus-leaved). *fl.* white; racemes spike-formed, panicled at the tops of the branches, tomentose. Summer. *l.* oblong-lanceolate, quite entire, hoary beneath. *h.* 12ft. to 14ft. Jamaica, 1825. Greenhouse tree.

Clethra *—continued.*

C. tomentosa (tomentose).* *fl.* white; racemes spicate, simple, bracteate, villously tomentose. July to October. *l.* cuneate-obovate, acute, finely serrated at top, clothed with white tomentum beneath. *h.* 3ft. to 4ft. Virginia, 1731. Hardy shrub. (W. D. B. 39.)

CLEYERA (named after Andrew Cleyer, M.D., a Dutch physician of the seventeenth century, once resident in Batavia). ORD. *Ternströmiaceæ.* Greenhouse evergreen shrubs, with the habit of *Ternströmia.* Flowers small, axillary, stalked, sometimes fragrant. Leaves alternate, undivided, leathery, similar to those of a Camellia. For culture, &c., *see* **Ternströmia.**

C. japonica (Japanese). *fl.* whitish-yellow, fragrant, axillary, solitary. *l.* oblong-lanceolate, veinless, serrulated at the apex. *h.* 6ft. Japan, 1820. (S. Z. F. J. 81.)

C. j. tricolor (three-coloured). *l.* dark green, with longitudinal and oblique bands of greyish-green; margin creamy-white, and tinged with bright rose-colour, which is very conspicuous in the younger foliage. A very handsome variegated greenhouse plant.

C. theoides (Tea-like). *fl.* cream-white, drooping, ½in. in diameter, solitary, on axillary, one-flowered peduncles. September. *l.* alternate on short petioles, coriaceous, elliptic-lanceolate, acute, serrated. *h.* 4ft. to 5ft. Jamaica, 1850. SYN. *Freziera theoides.* (B. M. 4546.)

CLIANTHUS (from *kleios*, glory, and *anthos*, a flower; referring to the handsome flowers). Glory Pea; Glory Vine; Parrot Beak. ORD. *Leguminosæ.* A genus containing a couple of species, one of which is a half-hardy evergreen, tall-growing, climbing shrub, and the other an herbaceous perennial. Flowers brilliantly coloured, large, about 2in. long, in short pendulous axillary racemes; petals acuminate; standard or vexillum reflexed. Leaves impari-pinnate; leaflets small, numerous, oblong; stipules foliaceous, adnate, permanent. These plants, with truly gorgeously-coloured flowers, were, at one time, extensively cultivated in the greenhouse; but, from their great liability to the attacks of red spider, and the difficulty often found in cultivating one of the species—*C. Dampieri*—they have now become somewhat neglected. Spider may be kept down considerably by syringing with clean water daily throughout the growing season. Scale sometimes attacks the plants, but careful hand-picking, and sponging with Fowler's Insecticide, prevent these doing much injury. Loamy soil, with a little leaf soil and charcoal added, is most suitable for Clianthus. It should not be sifted, but broken up by hand, and pressed firmly in the pots. After potting, the plants should be placed in a pit with other hard-wooded subjects, and kept close for a few weeks, being syringed daily. *C. Dampieri* is a very fastidious subject in a young state, as injury to the roots invariably causes the death of the plants. When allowing more root room, the plan is sometimes adopted of knocking the bottom out of the old pot, and placing the ball with the remainder in the new soil. Training must be regularly attended to, in order to keep the bases of the plants well furnished, as the wood, when old, is very liable to break off. If it is desirable to keep the plants in pots, they can be either trained out on sticks or a trellis, or on pillars or walls, for which purpose they are well adapted. Thorough drainage must be insured when planting out, and the compost may be the same as for potting, a depth of about 18in. being sufficient. Abundance of water must be given at the roots, and the syringe freely used. When grown in pots, the plants will require shifting annually during March or April, previous to which all the laterals should be pruned hard back, and the leading shoots also shortened. The same treatment as regards pruning applies to those planted out. Cuttings of *C. puniceus* strike easily in sand, on bottom heat. When established, this species grows vigorously, and forms a fine subject for a rafter in the conservatory, or for pot culture. *C. Dampieri* is best raised from seeds, which should be sown singly, in good-sized pots, when the necessity of first shifting will be obviated. Pots 5in. in diameter are none too large; and if the seeds

Clianthus—*continued.*

are sown in these, late in summer, the plants may remain until the following spring, when they should be potted on, without disturbing the roots in any way, into the full size in which they are to flower. *C. puniceus* especially, and sometimes *C. Dampieri*, will grow well out of doors in the south-western counties, when trained against a wall; but sufficient protection should always be given during the winter to prevent injury from frost. In Ireland, their hardihood is substantially the same.

C. carneus (flesh-coloured). *See* **Streblorhiza carnea.**

FIG. 476. CLIANTHUS DAMPIERI, showing Habit and Side View of Single Flower.

C. Dampieri (Dampier's).* Glory Pea. *fl.* red, with a black or dark purple blotch at the base of the standard, 4in. or 5in. across when expanded, five or six together; racemes drooping. March. *l.* neatly winged, silvery-grey, villous. *h.* 2ft. North and South Australia and New South Wales, 1852. Herbaceous perennial. When planting this outside, a hot, dry, and sunny position under a south wall should be selected, and the plant should be kept as dry as possible. See Fig. 476. (B. M. 5051.) *C. D. marginata* is the best of several varieties now in cultivation; in this form, the ground is white, bordered with red, and the spot black. 1866.

C. puniceus (reddish).* Parrot's Bill. *fl.* scarlet, very freely produced; keel large, boat-shaped, with a long beak. May. *l.*, leaflets alternate, oblong, retuse, coriaceous. Plant branched, shrubby, clothed with appressed silky hairs. *h.* 3ft. New Zealand, 1832. Half-hardy climber. This has not yet been discovered in a truly wild state, but it is a favourite with the Maories, who grow it near their habitations. (B. M. 3584.) *C. magnificus* is a strong-growing variety of this species.

CLICK BEETLES (*Agriotes lineatus, A. obscurus*, &c.). These Beetles are long, narrow, slaty-brown, black, or reddish. They may frequently be observed on grass land during summer. The common name is derived from the fact that the Beetle, when laid on its back, recovers its position by a spring, which is accompanied by a peculiar "clicking" sound. The grubs—Wireworms—of these Beetles are amongst the most destructive pests to both farm and garden crops.

The following remedies may be recommended for the extermination of the grubs. For fuller particulars, *see* **Wireworms.**

Traps, such as carrots, or slices of potato or turnip, placed about numerously in the ground, and carefully looked over every day, will greatly help to effect a clearance.

Nitrate of Soda, or *Salt*, may be applied to land intended for farm crops. It will tend to destroy the Wireworms where they exist in large quantities, and will also act as a manure.

CLIDEMIA (named in honour of Cleidemus, an ancient Greek botanist). ORD. *Melastomaceæ*. Hispid or hairy shrubs, from tropical America. Flowers white,

Clidemia—*continued.*

rose-coloured, or purple, paniculate or in axillary clusters, rarely terminal. Leaves usually crenated, three to seven-nerved. The genus contains about forty species, few of which are of any horticultural value.

CLIMATE. This term denotes the particular modification, constitution, or state of the atmosphere of any region or country, relative to heat, wind, moisture—in fact, all meteorological phenomena. The climatal influence exercised over plants is very marked. When acclimatising any plant, it is, as a rule, desirable to imitate, as closely as possible, those conditions of soil and temperature under which it exists in Nature. This is especially the case as regards the constitution of the soil and drainage. Of course, in estimating the temperature required for any plant, its natural habitat must be correctly known, both as to latitude and altitude. These are points which, if followed generally, would save much disappointment and loss. The climatal conditions of the locality should be one of the gardener's chief studies.

CLIMBERS are plants which attach themselves to some support, by means of tendrils, petioles, roots, &c., and must be technically distinguished from twiners, which rise by twisting their stems round any support.

CLINTONIA (named in honour of De Witt Clinton, at one time Governor of the State of New York). ORD. *Liliaceæ*. Lovely and interesting herbaceous perennials, admirably adapted for borders. They should be included in every collection of choice hardy plants. Clintonias thrive in sandy peat, in a damp, shady situation. Propagated by division of the roots, in spring. (The genus very commonly known as *Clintonia* (Douglas), belonging to *Lobeliaceæ*, is more properly called *Downingia*, as the *Clintonia* of Rafinesque has priority over that of Douglas). *See* **Downingia.**

C. Andrewsiana (Andrews's).* *fl.* deep rose-coloured, bell-shaped, from ¾in. to 1in. in length, disposed in umbels, succeeded by blue berries. *l.* broadly oblong to oblanceolate, acute or acuminate. *h.* 2ft. California.

C. borealis (Northern). *fl.* yellowish-green, in a small terminal umbel. May. *l.* radical, elliptical, ciliate. *h.* 1ft. North America, 1778. SYN. *Smilacina borealis*. (B. M. 1403.)

C. pulchella. *See* **Downingia pulchella.**

C. umbellata (umbelled). *fl.* whitish, disposed in a capitate umbel, on a leafless scape. May. *l.* radical, oblong, ovate, deep green. *h.* 6in. North America, 1778. SYN. *Smilacina borealis* var. (B. M. 1155.)

C. uniflora (one-flowered).* *fl.* white, usually solitary, rarely two, nearly 1in. long, pubescent. July. *l.* lanceolate, acute, attenuated below, much longer than the peduncle. *h.* 6in. North America. SYN. *Smilacina unifiora*. (H. F. B. A. 2, 190.)

CLITORIA (from *clitoris*, an anatomical term, a resemblance to the object denoted by which has been fancied to exist in the flower). Including *Ternatea*. ORD. *Leguminosæ*. Very handsome stove evergreen climbers. Flowers axillary, pedicellate, large, elegant. Leaves impari-pinnate, having two to numerous pairs of leaflets; but usually the leaves are pinnately-trifoliolate, and the leaflets stipellate. They thrive in a compost of peat, loam, and sand. Cuttings of stubby side shoots will root in sandy soil, if placed in heat, and covered with a bell glass; but the best method of increasing them is by seeds, which occasionally ripen in this country.

C. braziliana (Brazilian). *fl.* pink, large; pedicels twin, one-flowered; bracts ovate, longer than, and hiding, the calyx. July. *l.* pinnately trifoliate; leaflets ovate-oblong, glabrous. Brazil, 1759.

C. heterophylla (various-leaved).* *fl.* blue; pedicels solitary, one-flowered; bracteoles small, acute. July. *l.* impari-pinnate, with two to four pairs of roundish, ovate, or linear leaflets. Tropics everywhere, 1812. (B. M. 2111.)

C. mariana (Maryland). *fl.* pale blue and flesh-coloured; pedicels solitary, one to three-flowered; bracteoles lanceolate, smooth. August. *l.* pinnately trifoliate; leaflets ovate-lanceolate. United States, &c., 1759.

C. ternatea (three-leafleted).* *fl.* very curious and beautiful, being of a clear azure, set off by a horseshoe-shaped ring of pure white; pedicels solitary, one-flowered; bracteoles large, roundish.

Clitoria—*continued.*

July. *l.* impari-pinnate, with two to four pairs of oval or ovate leaflets. India, 1739. SYN. *Ternatea vulgaris.* (B. M. 1542.) There are varieties of this species with blue and white flowers, and also variegated with those colours.

CLIVIA (named after a Duchess of Northumberland, a member of the Clive family). ORD. *Amaryllideæ.* SYN. *Imantophyllum* (often erroneously written *Imatophyllum*). Handsome greenhouse evergreen bulbs, requiring a high temperature and plenty of moisture when growing. During the season of rest, they need very little heat or moisture, only just enough of the latter to keep the soil from being dust-dry. Propagated by divisions, or by seed. There are three species, all natives of South Africa, the best being the one here described.

C. Gardeni. *See* **Imantophyllum Gardeni.**

C. miniata. *See* **Imantophyllum miniatum.**

C. nobilis (noble).* *fl.* red, yellow, forty-eight to fifty in a pendulous umbel; perianth tubular, segments imbricate, outer shorter than inner. May. *l.* distichous, coriaceous, strap-shaped, sheathing at base, retuse and oblique at apex; margin rough, *h.* 1½ft. 1823. SYN. *Imantophyllum Aitoni.* (B. M. 2856.)

CLOCHES. *See* **Bell Glasses.**

CLOMENOCOMA MONTANA. *See* **Dysodia.**

CLOUDBERRY. *See* **Rubus Chamæmorus.**

CLOUD GRASS. *See* **Agrostis nebulosa.**

CLOVE, or **CLOVE PINK.** *See* **Dianthus Caryophyllus.**

CLOVER. *See* **Trifolium.**

CLOVE-TREE. *See* **Caryophyllus.**

CLOWESIA (named after the late Rev. J. Clowes, at one time an extensive Orchid grower, and in whose establishment the genus first flowered in this country). ORD. *Orchideæ.* An interesting little stove epiphytal Orchid, allied to *Catasetum*, and requiring the same treatment.

C. rosea (rosy). *fl.* delicate white, tinged with pink; scapes radical, many-flowered, erect, shorter than the leaves. March. Pseudo-bulb fleshy, leafy. *h.* 3in. Brazil, 1842. (B. R. 29, 39.)

CLUBBING. The formation of protuberances on roots, particularly those of the *Brassica* tribe, proving the most destructive disease these are subject to. It is generally caused by some insect. *See* **Cabbage.**

CLUB GALL WEEVIL. *See* **Cabbage Gall Weevil.**

CLUB MOSS. *See* **Lycopodium.**

CLUB RUSH. *See* **Scirpa** and **Typha.**

CLUMPS. This term is applied to groups of two or more trees, shrubs, or other plants, arranged to form an isolated mass. It may extend to almost endless combinations in landscape gardening, from a conspicuous group of fine trees in a park to one of small shrubs on a lawn. In selecting a position, or planting a Clump of any description, attention should be given to surrounding conditions, and forethought exercised as to its appearance when fully developed. This especially applies to planting Clumps of permanent trees. Rhododendrons are probably most largely grown as Clumps on lawns; but many other shrubs are very useful and attractive, if arranged in this way. Overcrowding should, in all cases, be avoided.

CLUSIA (named in honour of Charles de la Cluse, or Clusius, of Artois, an acute botanist, author of "Historia Plantarum," and many other works; born in 1526, and died in 1609). Balsam-tree. ORD. *Guttiferæ.* Stove evergreen trees and shrubs, often epiphytal, with large, coriaceous, opposite leaves, and usually tetragonal stems, abounding in viscid juice. There are about sixty species, nearly all natives of tropical parts of the Western hemisphere. They grow well in light sandy soil. The pots will require to be thoroughly drained. Cuttings of half-ripe shoots will strike in sand, if placed under a bell glass, and given plenty of bottom heat.

C. alba (white). *fl.* white. *h.* 30ft. West Indies, 1752.

C. flava (yellow). *fl.* yellow. *h.* 30ft. Jamaica, &c., 1759.

Clusia—*continued.*

C. rosea (rose-coloured). *fl.* beautiful rose-coloured, large; calyx the same colour, five to six-leaved; tops of dense nectaries awl-shaped. July. *l.* obovate, obtuse, veinless, sometimes emarginate, on short, striated petioles. *h.* 7ft. to 20ft. Carolina, 1692 (on rocks and trees).

CLUSTER CHERRY. An old name for the Bird Cherry. *See* **Cerasus Padus.**

CLUSTER-FLOWERED YEW. *See* **Cephalotaxus.**

CLUSTER PINE. *See* **Pinus Pinaster.**

CLUYTIA (named after Outgers Cluyt, 1590-1650, a Dutchman, who was Professor of Botany at Leyden). ORD. *Euphorbiaceæ.* Greenhouse evergreen shrubs, with white flowers. They thrive in a compost of sandy loam and fibry peat. Cuttings of small side shoots will root in sand, over a layer of sandy peat, covered with a bell glass; points of shoots, before they become hard, will serve as substitutes for cuttings, when the latter are not obtainable. This genus contains about thirty species, from tropical and Southern Africa; they are of little beauty or interest, and those which have been introduced are rarely seen in cultivation out of botanical gardens.

CLYPEATE. Scutate; shaped like a Roman buckler.

FIG. 477. FRUITING BRANCH OF CNEORUM TRICOCCUM.

CNEORUM (from *Cneoron*, a name given to some shrub resembling an Olive, by Hippocrates and Theophrastus). Widow-wail. ORD. *Simarubeæ.* Very ornamental greenhouse or half-hardy evergreen sub-shrubs, with axillary yellow flowers and entire linear-oblong leaves. They thrive in a compost of peat and fibry loam, to which a little silver sand has been added. Ripened cuttings root freely, about April, in sand, under a bell glass. Cneorums succeed fairly well outside, in an open border, in the southern counties; but in more northern localities, they require the shelter of a south wall. The genus is confined

Cneorum—*continued.*

to the Mediterranean region and the Canary Islands. It comprises but the two species here described.

C. pulverulentum (powdery).* *fl.* axillary; pedicels adnate to the base of the bracts. April to September. *l.* linear, entire. *h.* 1ft. to 3ft. Teneriffe, 1822. Plant covered with greyish powder.

C. tricoccum (three-berried). Spurge Olive. *fl.* axillary; pedicels not adnate to the bracts. *h.* 1ft. to 2ft. South Europe, 1793. Plant smooth. See Fig. 477.

CNESTIS (from *knео*, to scratch; in allusion to the capsules being covered on the outside with stinging hairs). ORD. *Connaraceæ*. Ornamental stove evergreen shrubs or small trees, with axillary, racemose, rarely paniculate inflorescence, and impari-pinnate leaves. All are natives of tropical and Southern Africa, Madagascar, and the islands of the Indian Archipelago. They require a compost of loam and peat, both of which should be fibry, with the addition of a small quantity of sand. Cuttings of ripe young shoots will root in sand, if placed in bottom heat, and covered with a bell glass. About ten species are known to science; perhaps not one is now in cultivation in this country.

CNICUS (from *chnizein*, to injure; alluding to the prickly armature of the plant). Thistle. SYN. *Cirsium*. ORD. *Compositæ*. A genus containing about 200 species of annual, biennial, and perennial herbs, of which but very few are in cultivation, and still fewer are worth the trouble of growing. Pappus deciduous, feathery; involucre swelling, imbricated with spinous scales; receptacle hairy. They are all of the easiest culture in ordinary soil. Propagated by seeds, sown in spring.

C. acaulis (stemless).* *fl.-heads* purple; involucre ovoid, glabrous. Summer. *l.* stalked, glabrous, radical, lanceolate, pinnatifid; lobes sub-trifid, spinous. *h.* 2ft. Europe (Britain). Perennial. (Sy. En. B. 692.)

C. altissimus (tallest).* *fl.-heads* purple; involucre bracteate, ovate. August. *l.* sessile, oblong-lanceolate, scabrous, downy beneath, toothed, ciliated; radical ones pinnatifid. *h.* 3ft. to 10ft. United States, 1726. Hardy herbaceous perennial. (G. C. n. s., xi. 437.)

C. ambiguus (ambiguous). *fl.-heads* purple. July and August. *l.* ciliate, spiny, downy beneath; lower ones stalked, oblong, acuminate, sub-sinuate; upper ones pinnatifid, auricled. *h.* 2ft. Tyrol, &c., 1820. Hardy perennial.

C. benedictus (blessed). Blessed Thistle. An ornamental biennial, with large deep green leaves, which are blotched and marbled with silvery-white. South Europe. This plant now forms a genus by itself; its proper name is *Carbenia benedicta*.

C. ciliatus (ciliated). *fl.-heads* purple; involucre ovate. August. *l.* amplexicaul, hispid, pinnatifid; segments two-lobed, spreading, spiny, downy beneath. *h.* 3ft. Siberia, 1787. Hardy perennial.

C. conspicuus (conspicuous). *fl.-heads* scarlet, large and very handsome, terminal; involucre long, conical. *l.* alternate, sessile; lower ones 6in. to 8in. long, deeply pinnatifid, or even bipinnatifid; margin waved and sinuated, and armed with short brown or purplish spines. Stem 3ft. to 6ft. high, erect, much branched, angled and furrowed. Mexico. Biennial. SYN. *Erythrolæna conspicua*. (B. M. 2909.)

C. discolor (two-coloured). *fl.-heads* pale purple, rarely white; involucre globose, with cobweb down. July, August. *l.* sessile, pinnatifid, hairy, downy beneath; segments two-lobed, spreading, spiny. *h.* 2ft. United States, 1803. Biennial.

C. Douglasii (Douglas's). A synonym of *C. undulatus*.

C. eriophorus (wool-bearing). *fl.-heads* purple; involucre woolly, spherical. July. *l.* sessile, pinnatifid, every other segment pointing upwards, spiny, scabrous. *h.* 2ft. Europe (Britain). Biennial. (Sy. En. B. 687.)

C. Grahami (Graham's). *fl.-heads* rich crimson, large. *l.* lanceolate, sinuate, spiny-toothed, snow-white beneath. *h.* 3ft. to 5ft. New Mexico, 1871. A handsome thistle, with slender-branched snow-white stems. Biennial.

C. spinosissimus (most spiny).* *fl.-heads* pale yellow, terminal, clustered. June to August. *l.* amplexicaul, pinnatifid, toothed, spiny, pubescent. Stem simple. *h.* 3ft. Europe, 1759. Hardy perennial. (B. M. 1366.)

C. undulatus (undulated).* *fl.-heads* purple, corymbose, scarcely rising above the leaves; scales of the involucre smooth, purplish, spiny at the point. Summer. *l.* pinnatifid, the lateral lobes elongated, often bifid, terminal lobe elongated; more or less spiny. *h.* 1ft. California. Perennial. SYN. *C. Douglasii*.

COARCTATE. Pressed together.

COBÆA (named after B. Cobo, a Spanish botanist). ORD. *Polemoniaceæ*. Very ornamental rapid-growing greenhouse or conservatory perennials. Flowers large, campanulate, solitary, and axillary; calyx foliaceous, persistent. Leaves pinnate, with two or three pairs of leaflets, and a terminal tendril. They are readily raised from seeds, in spring, a gentle bottom heat alone being necessary if the seeds are new; old seeds are not reliable. A free and moderately rich soil is necessary. Cobæas do best if planted out, but, at the same time, they thrive in large pots. In autumn, the long shoots can be pruned back, and fresh growth will be made in spring. The general gracefulness and very floriferous habit of these plants render them peculiarly well adapted for growing against bare walls, arches, porches, &c. For outdoor culture, they are generally, and most effectively, treated as annuals. The variegated form of *C. scandens* must be increased by cuttings, taken when young, in spring, and inserted in pots of sandy soil, placed in gentle bottom heat.

C. penduliflora (drooping-flowered).* *fl.* on drooping peduncles; corolla green, campanulate, with the tube 1in. long, divided at the edge into five strap-shaped, pendulous, wavy lobes, 3in. to 4in. long, which impart to the flowers an unique appearance. December. *l.* formed of two pairs of small oblong acute leaflets. Caraccas, 1868. A graceful, slender, cool stove climber. (B. M. 5757.)

FIG. 478. FLOWERING BRANCH OF COBÆA SCANDENS.

C. scandens (climbing).* *fl.* large, campanulate, with a short dark purple tube; lobes of corolla rather spreading, broad, short, roundish, imbricated, ciliated. May to October. *l.*, leaflets three pairs, elliptic, mucronate, marginate, and slightly ciliated; lower pair close to the stem, and sub-auriculate on one side at the base. Tendrils branched. Mexico, 1792. See Fig. 478. (B. M. 851.) There is a very ornamental form, having variegated foliage.

C. macrostema, Guayaquil, and *C. stipularis*, Mexico, are two interesting yellowish-green flowered species; but those described above are the best for general cultivation.

COB NUTS. *See* **Corylus.**

COBURGIA. This is now included in the genus *Stenomesson*.

COCCOCYPSELUM (from *kokkos*, fruit, and *kypsele*, a vase; in allusion to the form of the fruit). SYNS. *Sicelium*, *Tontanea*. ORD. *Rubiaceæ*. A genus of creeping soft-wooded stove plants. Peduncles axillary, solitary, and in the alternate axils, each bearing a few-flowered head, surrounded by a short involucre. Leaves opposite, on short petioles; stipules subulate, solitary on both sides. The species are of easy culture in a mixture of peat and sand. Increased readily by separating the creeping stems.

C. campanuliflorum (bell-flowered). *fl.* bright pale blue, in axillary or terminal heads; throat yellow. *l.* roundish oval, hairy, stalked. Brazil, 1827. SYN. *Hedyotis campanuliflora*. (B. M. 2840.)

C. cordifolium (heart-shaped-leaved). *fl.* white, pubescent, disposed in almost globose heads; peduncles ultimately equalling the petioles in length. *l.* cordate, obtuse, hairy. Brazil.

C. metallicum (metallic-leaved). *fl.* white. *l.* with a metallic lustre. Guiana, 1866.

C. repens (creeping).* *fl.* blue, almost sessile, collected in the axils of the leaves; heads few-flowered; peduncles very short while bearing the flowers, afterwards becoming more elongated. May. *l.* ovate, pubescent on both surfaces. West Indian Islands, 1793. Annual.

COCCOLOBA (from *kokkos*, a berry, and *lobos*, a pod; in reference to the fruit). Seaside Grape. ORD. *Polygoneæ*. A rather large genus of stove evergreen trees, some of which are ornamental. They grow well in good loam. Cuttings (of most of the species) of ripened wood, with leaves entire, taken off at a joint, will root freely in sand, under a bell glass. The best species are given below.

C. obovata (reversed-egg-shaped). *fl.* white, green. *h.* 50ft. New Grenada, 1824.

C. pubescens (downy). *fl.* white, green. West Indies, &c., 1690.

C. uvifera (grape-bearing). *fl.* white, fragrant. *l.* orbicular, cordate, leathery, bright glossy green. *h.* 20ft. West Indies, &c., 1690. (B. M. 3130.)

COCCULUS (from *coccus*, the systematic name of cochineal, applied to this genus on account of the greater part of the species bearing scarlet berries). SYN. *Wendlandia*. ORD. *Menispermaceæ*. A genus of stove, greenhouse, or hardy evergreen climbing or twining shrubs. Cymes or panicles axillary; those bearing the male flowers usually many-flowered; those bearing the female ones few-flowered. Leaves ovate or oblong, entire, rarely lobed. They thrive well in a mixture of loam and peat. Cuttings of half-ripened side shoots will root easily in spring or summer, if planted in sand and placed in bottom heat, under a bell glass.

C. carolinus (Carolina). *fl.* greenish, in axillary racemes or panicles. July. *l.* downy beneath, ovate or cordate, entire or sinuate-lobed. *h.* 20ft. United States. Plant minutely pubescent. Hardy.

C. laurifolius (Laurel-leaved). *fl.* white, green, small; peduncles lateral and axillary, branched at the top, rather shorter than the petioles. January. *l.* oblong, acuminated, smooth, shiny. Sub-tropical Himalayas, 1820. An ornamental shrub, with bright green leaves, remarkable for being a compact bush, whilst nearly all the other species are twiners. Half-hardy.

C. Thunbergii (Thunberg's). *fl.* axillary, panicled. *l.* ovate, obtuse, with a point, under surface villous; lower leaves somewhat triangular, upper ones orbicular. Japan. Hardy.

COCCUS. *See* **Scale Insects.**

COCCUS ADONIDUM. *See* **Mealy Bug.**

COCCUS VITIS. *See* **Vine Scale.**

COCHINEAL FIG. *See* **Opuntia cochinellifera.**

COCHLEARIA (from *cochlear*, a spoon; the leaves of most species are hollowed, like the bowl of a spoon). Scurvy Grass; Spoonwort. ORD. *Cruciferæ*. Annual or perennial herbs, usually smooth and fleshy. Racemes terminal; pedicels bractless, spreading, filiform or somewhat angular. Leaves very variable; radical ones usually stalked; cauline ones often auriculate-sagittate. There are about twenty-five species, widely distributed over the temperate and cold regions of the Northern hemisphere. Cochlearias are of the simplest culture in ordinary garden soil, but scarcely any are worth growing for ornament.

Cochlearia—*continued.*

Propagated by seeds (which are produced freely by most of the species), sown in the open air, in early spring.

FIG. 479. COCHLEARIA ARMORACIA.

C. Armoracia (Horse-Radish). *fl.* white, with a spreading calyx. May. *l.*, radical ones large, oblong, crenated; cauline ones elongated, lanceolate, toothed or cut. Root large, fleshy. *h.* 2ft. Eastern temperate Europe (naturalised in Britain). See Fig. 479. For detailed culture, *see* **Horse-Radish.**

FIG. 480. COCHLEARIA OFFICINALIS

Cochlearia—*continued.*

C. officinalis (officinal). Common Scurvy Grass. *fl.* white. Spring. *l.*, radical ones stalked, cordate; cauline ones ovate, toothed, angular. *h.* 2in. to 12in. Cold regions of northern hemisphere. A pretty early spring-flowering biennial. It is a valuable anti-scorbutic. See Fig. 480.

COCHLEATE. Twisted, so as to resemble the shell of a snail.

COCHLIOSTEMA (from *kochlion*, spiral, and *stema*, a stamen; in allusion to the spirally curved stamens). ORD. *Commelinaceæ*. This genus contains but a single species, as the two plants described below are mere forms of one. A very handsome stove perennial. It thrives in a compost of peat, leaf mould, and loam, in equal parts, with the addition of a small quantity of sand. Perfect drainage and a copious supply of water—both to the roots and overhead—are essential. Propagated by seed, which are obtained in abundance by means of artificial fertilisation. The anthers will be found inside the large stamen-like organs in the centre of the flower. The seed should be sown as soon as ripe, in sandy soil, in well-drained pots, and placed in a hotbed.

C. Jacobianum (Jacob's). *fl.* blue, delicately sweet, numerous, pedicellate, crowded at the ends of the stalks in a rather short, simple, scorpioid cyme; three outer segments of the perianth unequal, oblong, obtuse, hooded at the apex; three inner segments equal, obovate, their margins fringed with long, delicate, rich purple hairs. September. *l.* rich dark green, edged with a narrow margin of purple, oblong-lanceolate, 1ft. to 3ft. long, and 6in. to 8in. broad, sheathing at the base. Andes of Ecuador, 1867. This is one of the finest introductions of late years, and equally as valuable from a horticultural point of view as it is interesting from its peculiar structure. (B. M. 5705.)

FIG. 481. COCHLIOSTEMA ODORATISSIMUM.

C. odoratissimum (sweetest-scented). *fl.*, outer perianth segments yellowish-green at the base, reddish above; inner segments large, deep blue, with a large white claw. *l.* pale green above, long, sheathing, gracefully recurved; margins bordered with red; under surface red, marked with deep red-violet lines. The scent in this form is much more powerful than in *C. Jacobianum*. See Fig. 481.

COCHLOSPERMUM (from *cochlo*, to twist, and *sperma*, a seed; in allusion to the form of the seed). ORD. *Bixineæ*. Magnificent stove evergreen trees or shrubs. Flowers yellow, large, panicled, with the peduncles articulated at the base. Leaves alternate, stipulate, palmatifid or digitate; petioles jointed at the base. They thrive well in a compost of loam and peat. Cuttings of ripened shoots, taken in April, will root in sand, if placed in bottom heat, under a hand glass; but plants raised from seed make finer trees.

Cochlospermum—*continued.*

C. Gossypium (cottony). *fl.* yellow, large. May. *l.* three to five-lobed; lobes acute, entire, tomentose beneath. *h.* 50ft. India, 1822. SYN. *Bombax Gossypium*. (B. F. S. 171.)

The other two species reputed to have been introduced are *orinocense* and *vitifolium*.

COCKCHAFERS (*Melolontha vulgaris*). The Cockchafers, or May Bugs, are very destructive, both in the larval and the perfect state. In the latter condition, they are found during the spring, generally towards the end of May. They are rarely seen out in the day, choosing night to carry on their depredations. They feed chiefly on the leaves of the Oak, Hazel, Elm, and Willow, sometimes wholly denuding them of their foliage. Cockchafers belong to the order *Lamellicornes*, the antennæ of which are

FIG. 482. FEMALE AND MALE COCKCHAFERS.

lamellated, or consisting of a series of plates (see Fig. 482). The female lays her eggs in the earth, several inches below the surface, placing them one by one in a little heap until some eighty or ninety have been deposited. The eggs are somewhat oval, and of a white or pale yellow colour. They are hatched in about a fortnight. As soon as the larva has reached its full length (see Fig. 483), it measures 1½in. or more, and is dirty white, with brown head, and blackish at

FIG. 483. GRUB OF COCKCHAFER.

the tail end. By this time, it is three and a-half years old, and has subsisted on the tender roots of the plants. It then takes the pupa form, remaining in the earth until winter is past, and the perfect beetle emerges, as previously stated, in spring.

The following are a few of the numerous remedies recommended for the extermination of this troublesome pest. Where they abound in large quantities, they may be shaken down on to cloths spread under the trees, and afterwards collected and destroyed.

Starlings. In some nurseries and other large establishments, it is customary to hang nesting boxes around, for the benefit of the starlings, who soon take to the nests. As soon as the mature Cockchafer appears above ground, the starlings are ready to receive him, and the result is comparative freedom from the insect. Rooks, partridges, and some other birds, should also be encouraged, for when the soil is dug, particularly in a slight frost, they will clear off all the grubs they can reach.

Colza. The French sow colza on the ground infested with Cockchafer grubs, and when there is a good crop, it is dug or ploughed in. We have found rape, used in this manner, very serviceable.

Nitrate of Soda and Soot. This, sown at the rate of

Cockchafers—*continued.*

2cwt. of nitrate and 30 bushels of soot per acre, materially reduces the grubs numerically, particularly if the ground has been dug level, so that the mixture gets washed into the soil equally.

Gas Lime. Applied in the proportion of 40 bushels to the acre, this will kill nearly all grubs and insects, and will also manure the ground; but it must be ploughed in deeply before sowing. It is desirable that the ground should remain vacant for some time after.

COCKROACHES (*Blatta orientalis*). These pests are frequently, but erroneously, termed Black Beetles. In its mature state, the male has wings extending only half the length of the body; the female has only rudimentary

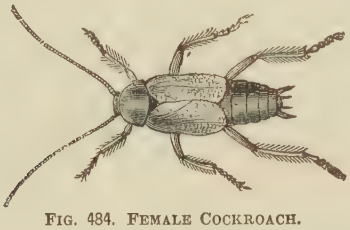


FIG. 484. FEMALE COCKROACH.

wings (see Fig. 484); her eggs, which are about sixteen in number, are enclosed in an oblong case, which she carries about with her at first, fixed to the abdomen by a sort of gum. There are several good recipes for the destruction of these; and, although not generally so numerous as some other insects, they are sufficiently so to demand attention. It should be remembered that, like Crickets, they will not always eat the same thing, and, therefore, if one remedy fails, another should be tried.

Cockroaches—*continued.*

Traps. The ordinary beetle traps sold at shops, if baited with honey or sprinkled with beer, will catch large quantities. Basins, containing beer, or beer and water, and having a few sticks placed against the sides to form a road, will also be found successful; soda water or champagne bottles, partly filled with beer and water, or weak honey syrup, and sunk into the earth, will prove very effective traps if not too often disturbed.

COCKSCOMB. *See* **Celosia.**

COCKSPUR THORN. *See* **Cratægus Crus-galli.**

COCOA-NUT FIBRE REFUSE. This is a most useful and inexpensive material, extensively employed by gardeners for various purposes. It is described as being free from any acid, saline, or tannin principle. The more recent or fresh it is, the longer it will last, and the better it is for all purposes. Being very light and easily worked, it forms one of the best materials for plunging small pots in, either in the propagating house or frame, in winter and spring, or outside, at any time. Cuttings of tender bedding plants are propagated by thousands annually in Cocoa-nut Fibre, as they root into it very quickly. It may also be used for potting such plants as these, but not for any subjects that are to be potted permanently, as it retains too much moisture, and decomposes so quickly. As a surface covering for flower-beds in summer, and for affording protection to the roots of somewhat tender plants during the winter months, Cocoa-nut Fibre Refuse is unequalled, in cheapness or otherwise. It may be employed with much success in rendering stiff, clayey, and other unfertile soils into productive ones, and is also useful in various other ways.

COCOA-NUT PALM. *See* **Cocos nucifera.**

COCOA PLUM. *See* **Chrysobalanus Icaco.**

FIG. 485. COCOS AUSTRALIS, showing Fruiting Plant before Stem is developed, and detached Fruit.

James's Phosphor Paste. Without exception, this is one of the best exterminators. Spread on slices of bread, or mixed with honey, the insect takes it readily. Two or three applications are generally sufficient.

Arsenic. This, prepared as for ants, or mixed with boiled potatoes, parsnips, or roasted apples, will also kill almost every one in a few nights.

Bracken. The fresh cut fronds of *Pteris aquilina*, laid about, are said to drive them away.

COCOS (from *coco*, the Portuguese for monkey; in reference to the end of the nut being like a monkey's head). Cocoa-nut Tree. ORD. *Palmæ.* A genus of elegant stove Palms, which, in their native countries, grow into majestic proportions. They are unarmed trees, with smooth, ringed trunks, and pinnatisect leaves, with linear segments. Spadices appearing in the axils of the lower leaves. Drupes with a fibrous husk and a solitary seed, with three holes at the base. They thrive in a compost

Cocos—*continued.*

of two parts rich loam, one part peat, and one of sand. During the growing period, copious supplies of water must be given, the quantity of which should be gradually diminished as winter approaches. They are not so well suited for sub-tropical gardening as many other genera of Palms; but, in a well-drained and sheltered spot, it is probable several of the species might prove satisfactory.

C. australis (Southern). *l.* pinnate, with very numerous linear-glaucous pinnæ. Stem erect, columnar, in old specimens 20ft. to 30ft. high. Buenos Ayres and Paraguay. A slow-growing, decidedly ornamental Palm. See Fig. 485.

Cocos—*continued.*

orange-coloured nuts, enclosed in an edible pulp, about as large as an English acorn. (B. M. 5180.)

C. Romanzoffiana (Romanzoff's).* *l.* long, gracefully arched; pinnæ long, pendent, dark green. Brazil. A handsome decorative species.

C. schizophylla (cut-leaved).* *l.* pinnate, spreading, dark green, gracefully arched, 6ft. or more in height; pinnæ 2ft. long, 1in. broad; apical lobe 6in. to 8in. broad, deeply bifid; petioles bordered with red; edges armed with stout red spines. *h.* 8ft. Brazil, 1846.

C. Weddeliana (Weddel's).* *l.* 1ft. to 4ft. or more in length, gracefully arched; pinnæ disposed nearly the whole length of the petioles, long, narrow, pendent, dark green on the upper surface,

FIG. 486. COCOS WEDDELIANA.

C. nucifera (nut-bearing). Cocoa-nut Palm. *l.* pinnate, 6ft. to 20ft. in length; pinnæ long, somewhat narrow and pendent, bright glossy green. *h.* 50ft. East Indies, 1690. A very common species in tropical countries, but somewhat difficult to cultivate in this country. (J. B. 1879, 202.)

C. plumosa (feathery).* *l.* pinnate, 3ft. to 15ft. in length; pinnæ clustered together in bunches, 1ft. to 2ft. in length, about 1in. in breadth, somewhat obtusely pointed, dark green above, glaucous below. Stem stout, straight, columnar. *h.* 40ft. to 50ft. Brazil, 1825. A highly ornamental tree, with long leaves and drooping bunches of waxy flowers, which are succeeded by quantities of glaucous beneath. Stem slender, clothed with a quantity of black netted fibres. South America. This is probably the most elegant small palm ever introduced into Europe, and one that should be in every collection of stove plants. SYNS. *Leopoldinia pulchra* and *Glaziova elegantissima*. See Fig. 486, for which we are indebted to Mr. William Bull.

There are many other species of this genus, among which are: *capitata, comosa, coronata, flexuosa, lapidea,* and *oleracea.*

CODIÆUM (from *Codebo*, Malayan name for one species). SYNS. *Croton* and *Phyllaurea.* ORD. *Euphorbiaceæ.* A

Codiæum—*continued.*

genus of stove evergreen shrubs. Male flowers: calyx membranous, three to six (often five) parted, reflexed, imbricate; petals five, scale formed, shorter than the calyx, and alternating with as many glands; stamens numerous. Female flowers: calyx five-cleft; petals absent. Ovarium girded by five hypogynous scales at base, three-celled, a single ovule in each cell. Among ornamental-foliaged plants, few, if any, are more useful or beautiful than the different varieties of this genus, several of which, besides having magnificently-coloured leaves, are very remarkable on account of their singular form. Excepting Dracænas, no similar class of plants are more easily cultivated than Codiæums; and, as they are available for use all the year round, no stove, however small, should be without, at least, one or two varieties. When required for table decoration, they should be grown with single stems. The best way to obtain these is to take off the tops of any strong leading shoots, and form them into cuttings. They may be struck by placing singly in small pots, and covering with bell glasses, in strong, moist heat, where they will soon emit roots, without losing any of the leaves attached at the time they were inserted. When fairly struck, they should receive a little air, by tilting the glass, gradually affording more till they bear full exposure. The most useful sizes for table decoration are from 1ft. to 18in. high; and, as using the plants for this purpose often causes them to lose their lower leaves by the time they reach such a height, the tops may be again taken off and put in as cuttings. They must be grown in a very moist atmosphere, and be well attended to by watering and syringing, or red spider is sure to appear. This pest and thrips are the two worst enemies to contend with in growing Codiæums, and no pains should be spared to rid the plants of them so soon as they are seen, as they quickly commit irreparable damage. The most effective remedy for thrips is to dip the heads of the plants in strong tobacco water, which destroys the insects, and also their eggs. For spider, there is nothing so effectual as hand-washing, with a soft sponge and soap water. Insects increase most rapidly when the air of the house becomes too dry, or the plants suffer from want of water at the roots. Besides being of so much value for table decoration, and the embellishment of rooms generally, Codiæums are equally serviceable for furnishing conservatories and other cool houses during the summer and autumn months—a time when such fine-foliaged plants may be employed with good effect. When used in this way, they must be gradually hardened before venturing to place them out of stove heat, as they are very susceptible to cold, and sudden changes cause their leaves to fall off. The soil best suited is fibry loam, with the addition of a good sprinkling of sand, to keep it open and porous. In this, with due attention to their requirements as to water, &c., they will grow very freely Plants required for large specimens, either for decoration or exhibition purposes, should be encouraged to make plenty of side branches, pinching the end of the leading shoot, if they do not start freely without; but, generally, they require very little assistance, as their natural growth is bushy and regular. In order to bring out to the fullest extent the rich markings of the leaves, it will be necessary to subject the plants to plenty of light, by placing on pans, or inverted pots, so as to raise them above others they may be growing amongst. One great advantage in growing Codiæums is that they can be

Codiæum —*continued.*

confined to small pots, and kept to a limited size, if desired, for a great length of time. The temperature most suitable for winter is one ranging from 60deg. to 70deg., according to the state of the weather. All the undermentioned have probably originated from two or three species, and they are now generally classed by catalogue compilers under the erroneous generic term of *Croton*, from which genus the present one is not only distinct, but it belongs to a different section of *Euphorbiaceæ*.

The majority of the innumerable forms cultivated in gardens may be referred to *C. pictum*. Scarcely more than three or four *species* exist, and about these all the Codiæums may be grouped as seedling forms or sports.

C. albicans (whitish).* *l.* broad-lanceolate, 12in. to 15in., long, 2in. to 3in. broad; ground-colour dark shining green, beautifully variegated with ivory-white; under side slightly tinted with crimson. A dense-growing variety.

C. angustifolium (narrow-leaved). A synonym of *C. angustissimum*.

C. angustissimum (narrowest).* *l.* drooping, linear, 12in. to 18in. long, ⅛in. to ¼in. broad, channelled, bluntish at the apex, tapering at the base; upper surface dark shining green; margins and midrib golden-yellow; under surface similar, but paler. Polynesia. SYN. *C. angustifolium*.

C. aucubæfolium (Aucuba-leaved).* *l.* dark shining green above with yellow or somewhat crimson blotches; 6in. to 8in. long, 2in. to 2½in. wide, three to four times longer than the stalk, oblong-acuminate, tapering at the base; midrib and veins green, or slightly tinged with pink. Polynesia, 1868.

FIG. 487. CODIÆUM BARON FRANCK SEILLIÈRE.

C. Baron Franck Seillière.* *l.* very close together, thick and leathery, from 10in. to 15in. long, and from 2½in. to 3¼in. broad, graceful, curved at the tip, of a brilliant green, light pink underneath when adult; the large nerves are of a pale yellow, but soon become ivory-white, as does also the petiole. Stem robust, green. Plant extremely vigorous. In the young specimens, the costa, besides being large, is very frequently irregular; but in adults, it is invariably straight; the lateral nerves are of a very beautiful white, and the contrast of

Codiæum—*continued.*

colours produces a very striking effect. See Fig. 487. (R. H. 1880, p. 193.)

C. Burtonii (Burton's). *l.* lanceolate, 12in. to 15in. long, about 3in. wide at the broadest part, close set and arching, dark shining green, banded and marbled with rich golden-yellow.

C. chelsoni (Chelsea).* *l.* narrow, drooping, sometimes plain, sometimes twisted spirally; in this latter state, the variegation shows up most distinctly, being of a bright salmon-orange tint, shaded with crimson. New Guinea, 1879.

C. chrysophyllum (golden-leaved). *l.* small, yellowish. Polynesia, 1875.

C. Cooperi (Cooper's). *l.* with yellow veins and blotches, ultimately changing to red. Polynesia, 1874.

Codiæum—*continued.*

C. cornutum (horned).* *l.* eight to ten times longer than the stalks, about 1in. wide, oblong, obtuse, irregularly lobed; lobes oblong lanceolate, acute or obtuse, rounded at the base, sinuous at the margin; upper surface dark shining green, irregularly mottled with yellow; midrib deep golden yellow, excurrent near the apex into a thread-like process, ½in. long. Polynesia, 1870.

C. Crown Prince.* *l.* lanceolate, acuminate, 12in. to 15in. long, 2in. wide, bright shining green; midrib and primary veins bright golden-yellow. An erect-growing sort, sometimes having leaves beautifully marbled over the entire surface.

C. Disraeli (Disraeli's).* *l.* about 1ft. in length, marked on a green ground-colour with golden ribs and veins, broadish at the base, and throwing out two side lobes of moderate development,

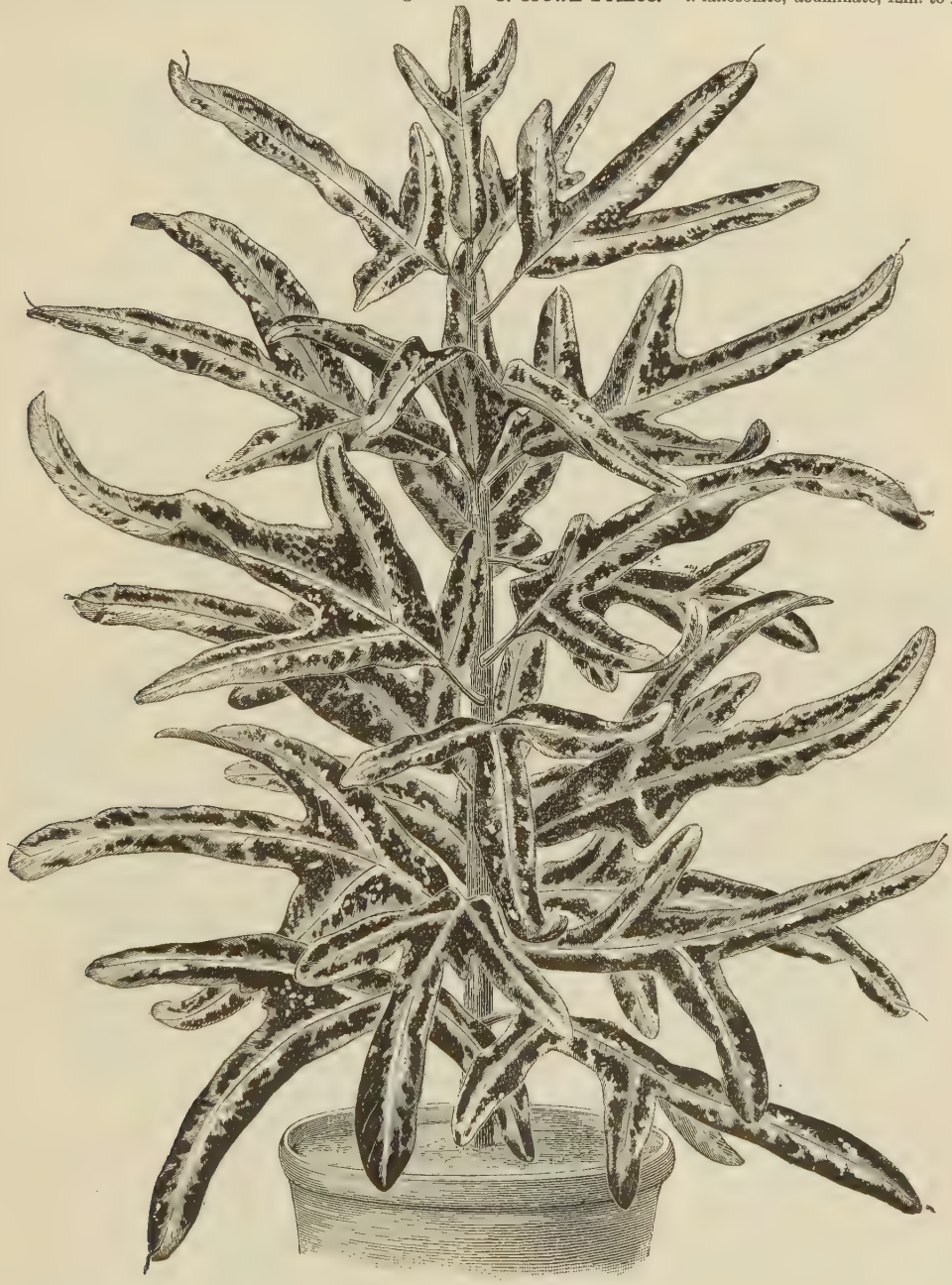


FIG. 488. CODIÆUM ILLUSTRIS.

Codiæum—*continued.*

the middle lobe, which is contracted in the lower portion and broader upwards, being much longer than the others, thus becoming more or less distinctly halbert-shaped. Polynesia, 1875.

C. Dodgsonæ (Mrs. Dodgson's).* *l.* linear-lanceolate, 9in. to 12in. long, ¾in. to ⅔in. broad, sometimes becoming spiral; bright green, with a very rich gold stripe centre; margins the same colour. Habit very graceful.

Codiæum—*continued.*

C. elegans (elegant).* *l.* 6in. long, ½in. wide, ten to twelve times longer than the stalk, linear-lanceolate, rather obtuse at the apex; upper surface dark green, midrib crimson or yellowish, margins slightly pink; lower surface dull green, mottled with purple. India, 1861. SYN. *C. parvifolium.*

C. Evansianum (Evans's).* *l.* bright olive-green, trilobed; midribs and veins golden-yellow; the interspaces spotted with the same colour; with age, the green deepens and changes to a bright bronzy-crimson, and the midribs, veins, and spots become a rich orange-scarlet. Polynesia, 1879.

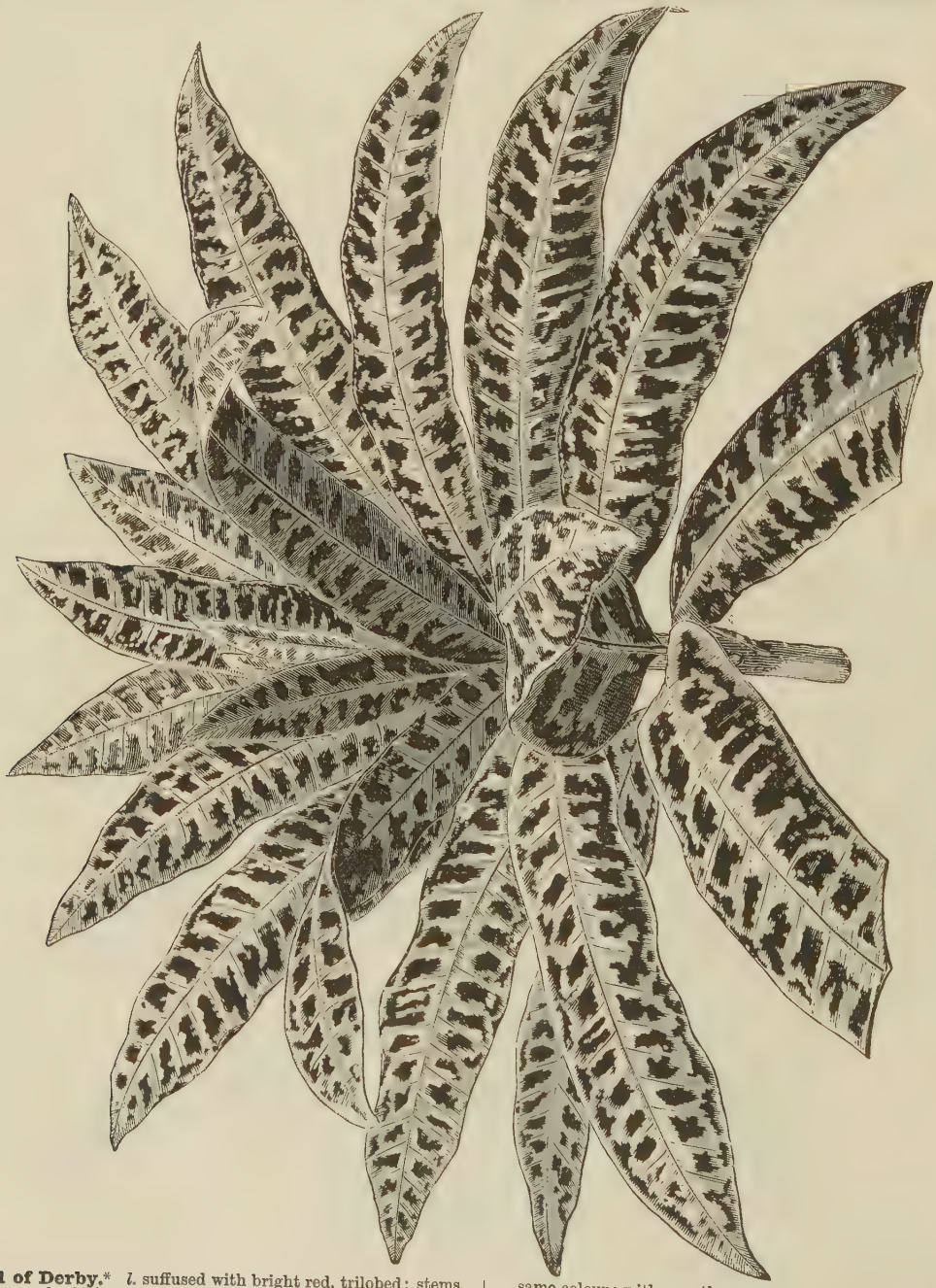


FIG. 489. CODIÆUM NEVILLIÆ.

C. Earl of Derby.* *l.* suffused with bright red, trilobed; stems, petioles, and midribs of a very bright yellow.

C. eburneum (ivory-white). *l.* elliptical-lanceolate, slightly recurved, 6in. long, 1½in. in breadth, deep green, with a broad central band, from ½in. to ⅔in. wide, of a clear ivory or creamy white, the white running out half way to the margin in acute projections at the bases of the principal veins.

C. fucatum (painted). *l.* obovate-elliptic, sometimes blotched in the lower half with broad irregular patches of yellow on one or both sides of the midrib, sometimes having only a yellow midrib and yellow reticulations; petioles rose-coloured. Polynesia.

Codiæum—*continued.*

C. gloriosum (glorious).* *l.* long, narrow, drooping; ground-colour green, variegation creamy-yellow, very variable in character. In some, there is a creamy-yellow midrib, with a band on each side; in others, the midrib is bright green; the markings are of the spotted style, with here and there large blotches of creamy-yellow, and in other parts clouded markings, of smaller confluent blotches and spots. Sometimes these conditions are reversed, and there are longish patches on which the ground-colour is creamy, relieved by a few clouded green markings. New Hebrides, 1878.

C. Goldiei (Goldie's).* *l.* broad, panduriform, and trilobed, 8in. to 10in. long, 3in. broad at the widest part, dark olive-green; midrib, primary veins, and margin deep golden-yellow.

C. grande (grand). *l.* deep green; midrib and some scattered spots yellow. Polynesia.

FIG. 490. CODIÆUM RECURVIFOLIUM.

C. Hanburyanum (Hanbury's). *l.* 15in. long, 2½in. broad, olive-green, finely marked with rich golden-yellow and rosy-crimson.

C. Hawkeri (Hawker's).* *l.* broadly lanceolate, about 6in. long, mostly, with the petioles, light creamy-yellow; margins bright green. Polynesia, 1879.

C. Henryanum (Henry's). *l.* oblong-ovate, acuminate, 9in. long

Codiæum—*continued.*

3in. broad, dark green, suffused and mottled with golden-yellow; in some cases, the leaf s distinctly banded.

C. Hilleanum (Hill's).* *l.* 6½in. long, 2½in. wide, six or seven times longer than the stalk, oblong sub-spathulate, acuminate, tapering at the base; margins sinuous; upper surface shining purplish-green, midrib and secondary veins bright crimson; lower surface dull purple, veins crimson. Polynesia, 1868.

C. Hookerianum (Hooker's).* *l.* broadly ovate-lanceolate, abruptly tapering or rounded at the base; upper surface beautiful dark shining green, broken at the base with a broad blotch of golden-yellow, and with irregular projections of the same colour running from the midrib towards the margin; midribs, young stems, and petioles golden-yellow. Erromango, 1869.

C. illustris (brilliant). *l.* green, richly maculated with golden-yellow, the central bar yellow, and the variegation irregularly distributed, so that sometimes the points are almost wholly golden; mostly three-lobed, on purplish petioles, the base being oblong, succeeded by two lateral alternate lobes, which, as well as the apex, appear to be twisted or curved, so as to acquire a sort of forked appearance. An extremely distinct and attractive plant. See Fig. 488, for which we are indebted to Mr. Bull.

C. imperator (commanding).* *l.* 12in. to 18in. long, 3in. wide

FIG. 491. CODIÆUM TRIUMPHANS HARWOODIANUM.

Codiæum—*continued.*

at the broadest part, arching, pale green, much suffused and mottled with creamy-white; petiole, midrib, and margin distinctly marked with a deep tint of the same colour.

C. imperiale (imperial). *l.* twisted, with yellow margins and blotches, changing to crimson. New Hebrides, 1875.

C. insigne (remarkable).* *l.* linear-oblong, deep green; midrib and veins beautiful golden-yellow; margins rosy-crimson. In the older leaves, the markings run in from the edge, and become suffused over the central bar, so that the colours become nearly equally balanced, in which state the foliage is very handsome.

C. interruptum (interrupted). *l.* linear-lanceolate, tapering at the base, acute or obtuse at the apex, sometimes twisted spirally below the middle, sinuous at the margin; upper surface dark purplish-green, midrib crimson; under surface purplish, midrib crimson. Polynesia, 1868.

C. irregulare (irregular).* *l.* oblong, tapering at the extreme base, dilated above, again contracted below the middle, acute at the apex; upper surface dark shining green above, with a few golden blotches, midrib golden-yellow, margin sinuous; lower surface dull green, midrib pale yellow. Polynesia, 1868.

C. Jamesii (James's).* *l.* ovate, 5in. to 8in. long, 3in. wide, dark sage-green, marbled with creamy-white and various shades of green and yellow. Very distinct, of dwarf free-branching habit.

C. Johannis (John's).* *l.* linear-lanceolate, acute, tapering at the base; upper surface slightly channelled, shining green, centre and margins orange-yellow; under surface similar, but paler. Polynesia, 1871.

C. lacteum (milk-white). *l.* oblong, spathulate, bluntly acuminate, tapering at the base; margins sinuous, whitish; upper surface dark shining green, midrib and secondary veins milky or yellowish-white; under surface dull green. Polynesia.

C. lancifolium (lance-leaved). *l.* narrow-lanceolate, 9in. to 15in. long, 1½in. broad at the widest part, dark green; midrib, margin, and primary veins pale yellow, eventually becoming reticulated with bright rosy-pink. Distinct, erect-growing.

C. limbatum (bordered). *l.* spotted and margined with yellow. India, 1873.

C. Macfarlanei (Macfarlane's). *l.* linear-lanceolate, pendulous, arching, 9in. to 12in. long, 1in. broad, dark fiery crimson when mature; young leaves rich yellow, irregularly blotched with dark green.

C. maculatum (spotted). *l.* lanceolate, sub-acuminate, tapering at the base, 10in. to 12in. long; upper surface dark shining green, irregularly speckled with yellow, midrib, secondary veins, and margins golden-yellow; under surface similar, but paler.

C. m. Katonii (Katon's). *l.* bright green, with round yellow spots. Polynesia, 1878.

C. majesticum (majestic).* *l.* rather narrow, 12in. to 18in. long, deep green, ribbed with yellow when young, the green changing with age into a deep olive, and the yellow becoming crimson. Polynesia, 1876. This plant has a very elegant drooping habit.

C. maximum (largest). *l.* oblong, acute, rounded at the base, 10in. to 12in. long; margins sinuous, yellow; upper surface bright shining green, with a few yellow blotches, midrib and secondary veins golden; lower surface dull greenish-yellow. Polynesia, 1868.

C. medium variegatum (middle variegated).* *l.* oblong, obtuse, acuminate, tapering at the base, 3½in. to 4½in. long, 1in. to 1½in. wide; margins golden, sinuous; upper surface dark shining green, midrib and secondary veins golden-yellow; under surface dull pale green. India. This species is commonly grown in gardens under the name of *C. variegatum.*

C. Mrs. Dorman.* *l.* linear-lanceolate, arching, smooth and regular, 12in. to 15in. long, ¼in. broad, with a conspicuous irregular rich orange-scarlet stripe in the centre; margins green.

C. multicolor (many-coloured). *l.* of somewhat irregular form, with a shape not very unlike *C. irregulare*; in a young state light green, with yellow tracings, but in a matured state dark green, blotched with yellow, deep orange, and crimson; midrib red; secondary veins yellowish. Polynesia, 1871.

C. mutabile (variable). A synonym of *C. princeps.*

C. Nevilliæ (Lady Dorothy Nevill's).* *l.* oblong-lanceolate, olive-green when young, barred and marked with yellow; when mature, the yellow changes to a crimson, shaded with orange, the green becomes darker, and is suffused with a metallic hue. Polynesia, 1880. See Fig. 489, for which we are indebted to Messrs. Veitch and Sons.

C. parvifolium (small-leaved). A synonym of *C. elegans.*

C. pictum (painted). *l.* oblong, acuminate, 6in. to 9in. long; ground-colour rich crimson, irregularly blotched and spotted with bright green and black. India. (B. M. 3051.)

C. Pilgrimii (Pilgrim's).* *l.* ovate, acuminate, 6in. to 9in. long, 3in. broad, pale green, with deep golden markings, heavily suffused with rich pink.

C. Prince of Wales. *l.* pendulous, arching, slightly twisted, almost entirely pale yellow, margined and mottled with bright carmine; edges beautifully undulated; midrib and petiole bright magenta.

C. princeps (princely).* *l.* broad linear, at first green, with a yellow costa, yellow margins, and a few scattered yellow blotches

Codiæum—*continued.*

on the blade; when mature, these colours are entirely changed, the green portions into a dark bronzy hue, and all the yellow markings, including the midrib, into the richest rosy-crimson. New Hebrides, 1878. SYN. *C. mutabile.*

C. Queen Victoria.* *l.* oblong-lanceolate, 9in. to 12in. long, 2in. broad, rich golden-yellow, finely mottled with green; midrib and primary veins rich magenta, changing with age to a vivid crimson; margin unevenly banded with carmine, often extending as far as the midrib. Of free-branching habit and medium growth.

C. recurvifolium (recurved-leaved). A very fine and distinct broad-leaved variety, of dense habit, and with recurved foliage far superior to the well-known *C. volutum.* The midribs and veins, which are crimson, bordered with yellow, are much sunk, giving the upper surface of the leaves a rigid and waved appearance. The variegation is well marked, and the contrast of the different tints to the deep olive-green ground colour is very pleasing. See Fig. 490, for which we are indebted to Messrs. Veitch and Sons.

C. spirale (spiral).* *l.* spiral, 9in. to 12in. long, and about 1in. wide, pendulous; in a young state, deep green, striped up the centre with a broad band of golden-yellow; when mature, deep bronzy-green, with a deep crimson midrib. South Sea Islands, 1873.

C. Stewartii (Stewart's). *l.* obovate, rounded at the base, shortly stalked, dark olive-green, irregularly banded and margined with rich orange; midrib and petioles bright magenta. New Guinea, 1880.

C. superbiens (superb).* *l.* oblong, acute, rounded at the base; colouring exceedingly rich and unique; in the least-coloured condition, they are green, with clouded yellowish markings; as these mature, the green deepens, the yellow brightens, and the coppery-red veining and margin are brought out; subsequently, the green becomes blackish-bronze, while all the pale portions become coppery, the veins and costa being crimson. New Guinea, 1878.

C. tricolor (three-coloured).* *l.* oblong-spathulate, very acute, gradually tapering from the upper third to the base; margin sinuous; upper surface dark shining green, central portion and midrib golden-yellow, secondary veins uncoloured; lower surface dull reddish-green. Polynesia, 1868.

C. trilobum (three-lobed). *l.* three-lobed, blotched with yellow. Polynesia, 1875.

C. triumphans (triumphant).* *l.* oblong, deep green, with a golden line on each side the midrib; primary veins also golden, running into a network of the same colour towards the point; costa rich bright crimson; when fully matured, the leaves become rich greenish-bronze, and the costa an intense rosy-crimson. New Hebrides, 1878.

C. t. Harwoodianum (Harwood's). *l.* deep green, with a golden line on each side the midrib; principal veins also golden, running into a network of the same colour towards the point; costa rich bright crimson, forming a pretty contrast with the colour on either side. A fine variety from the New Hebrides. When fully matured, the leaves become rich greenish-bronze, and the costa an intense rosy-crimson, very bright and effective. See Fig. 491, for which we are indebted to Mr. Bull.

C. undulatum (undulated).* *l.* oblong, acuminate, 8in. to 9in. long, 1½in. to 2in. wide, tapering at the base, crisped or undulate at the margins; upper surface of a rich claret-colour, with crimson blotches, midrib purplish; lower surface claret-coloured, with crimson blotches, and green secondary veins. Polynesia.

C. Veitchii (Veitch's).* *l.* oblong-lanceolate, rounded at the base, about 12in. long; margins pink; upper surface dark shining green, midrib and secondary veins bright pink; lower surface claret-coloured. Polynesia, 1868.

C. volutum (rolled-leaved). *l.* with golden venation, rolled in at the tip. Polynesia, 1874.

C. Warrenii (Warren's).* *l.* spiral, linear-lanceolate, 25in. to 30in. long by 1in. to 1½in. broad, pendent, arching, dark green, irregularly mottled, and suffused with orange-yellow and carmine, which, in the old leaves, changes to crimson. Polynesia, 1880. Said to be the most graceful and best of the narrow-leaved section.

C. Weismanni (Weismann's).* *l.* linear-lanceolate, 10in. to 11in. long, tapering at the base, very acute at the apex; margins sinuous; upper surface dark shining green, with a few small golden blotches, midrib and margins golden-yellow; under surface similar, but paler green. Polynesia, 1868.

C. Williamsii (Williams's).* *l.* obovate-oblong, 12in. to 15in. long, 3in. to 4in. broad; edges finely undulated; when young, irregularly banded with yellow, and midrib and primary veins of a bright magenta colour; as they become more mature, this magenta changes to a rich violet-crimson; under surface rich crimson. One of the handsomest.

C. Wilsonii (Wilson's). *l.* linear-lanceolate, 18in. to 20in. long, 1in. to 1½in. broad, pendent, arching, bright green, irregularly suffused with rich yellow. New Guinea, 1880.

C. Youngii (Young's).* *l.* 10in. to 20in. long, and nearly 1in. wide; upper surface dark green, irregularly blotched and spotted with pale yellow and rosy-red; under surface of a uniform dark red. Polynesia, 1873.

CODLIN GRUB. *See* **Apple or Codlin Grub.**

CODLINS AND CREAM. *See* **Epilobium hirsutum.**

CODONOPSIS (from *kodon*, a bell, and *opsis*, resemblance; in reference to the shape of the flowers). SYN. *Glossocomia.* ORD. *Campanulaceæ.* A genus of glabrous herbs. Flowers whitish, yellowish, or deep purple, terminal, axillary, pedunculate. Leaves alternate or nearly opposite, ovate, acuminated, not entire, on short petioles, glaucous, rarely hoary beneath. Branches usually opposite more or less articulated at their origin.

C. clematidea (Clematis-like). *fl.* white, tinged with blue. *l.* stalked, ovate, acuminate. *h.* 2ft. to 3ft. Mountains of Asia. Hardy perennial. SYN. *Glossocomia clematidea.* (R. G. 167.)

C. cordata (cordate). A synonym of *Campanumæa javanica.*

C. gracilis. *See* **Campanumæa gracilis.**

C. rotundifolia (round-leaved). *fl.* yellowish-green, veined with dark purple, large; corolla urceolate-globose, campanulate, with an inflated tube; peduncles terminal, slender, one-flowered. *l.* petioled, opposite or rarely alternate, ovate, rather obtuse. Himalaya. A long, slender, climbing annual. (B. M. 4942.)

C. r. grandiflora (large-flowered). A very pretty variety, with a more variegated corolla than the type, the flowers very much resembling those of the Deadly Nightshade (*Atropa Belladonna*). Himalaya. (B. M. 5018.)

CŒLESTINA (from *cœlestis*, celestial; in reference to the blue-coloured flowers). ORD. *Compositæ.* This genus is now merged into *Ageratum.* Half-hardy, showy, herbaceous perennials. Pappus a membranous rim; involucre cylindrical, many-leaved, imbricated; receptacle convex, naked; florets all tubular. They are of easy culture in ordinary garden soil. Propagated by seeds and cuttings, which are easily managed in gentle warmth, in spring.

C. ageratoides (Ageratum-like).* *fl.-heads* blue. July to October. *l.* stalked, ovate, acute, rounded at base, serrated, pilose above, hairy beneath. *h.* 1ft. New Spain.

Other species are *cærulea* and *micrantha*, both blue-flowered, and natives of America; but they are scarcely worth growing.

CŒLIA (from *koilos*, hollow; in allusion to the pollen masses, which are convex outside and concave inside). ORD. *Orchideæ.* Very curious and pretty stove epiphytal Orchids. Sepals distinct, equal, spreading; petals nearly equal, but a little smaller than the sepals; lip quite entire, unguiculate, continuous with the base of the column, which is short. For culture, &c., *see* **Epidendrum.**

C. Baueriana (Bauer's).* *fl.* white, fragrant; racemes many-flowered; bracts long. June. *l.* ensiform. Pseudo-bulbs ovate. *h.* 1ft. West Indies, &c., 1790. (B. R. 28, 36.)

C. macrostachya (large-spiked).* *fl.* red; racemes many-flowered; bracts linear-lanceolate, acute, squarrose; lip lanceolate, bisaccate at base. April. *l.* ensiform, plicate. Pseudo-bulbs large, almost globose. *h.* 1½ft. Guatemala, 1840. (B. M. 4712.)

CŒLIOPSIS (from *Cœlia*, and *opsis*, resemblance; resembling a Cœlia). ORD. *Orchideæ.* A stove epiphytal Orchid, requiring cultivation similar to **Epidendrum** (which *see*).

C. hyacinthosma (Hyacinth-scented).* *fl.* white; point of the superior sepal, and of the petals, orange; lip white, base and apex orange, with a deep crimson blotch in the middle; foot of column purplish-crimson; peduncle arising from the base of the well-sheathed bulb, with a dense raceme of six to eight flowers, which have a most delicious Hyacinth-like scent. *l.* plaited, cuneate-oblong, acute. Pseudo-bulbs pear-shaped. Panama, 1871.

CŒLOGYNE (from *koilos*, hollow, and *gyne*, female; in reference to the female organ, or pistil). ORD. *Orchideæ.* Including *Pleione.* Very handsome stove epiphytal orchids, described as follows: A race of pseudo-bulbous Orchids, conspicuous for large coloured membranous flowers, with converging and slightly spreading sepals; petals of like nature,

Cœlogyne—*continued.*

but narrower; a great cucullate lip, usually bearing fringes on its veins; and a broad membranous column. The majority of the species are what may be termed cool-house, or, at any rate, intermediate-house, plants; for, although they like a somewhat higher temperature when growing, they remain more healthy, and flower more abundantly, if kept quite cool during the resting and flowering period. Pot culture is preferable for these plants, although they may also be grown upon blocks of wood. When small, and under this latter treatment, they are apt to dwindle away, instead of increasing in size. In preparing the pots or pans, good drainage must be carefully provided, as, although Cœlogynes require and enjoy a liberal supply of water during the growing season, nothing stagnant or sour must be allowed to come near the roots. A good compost may be formed of about equal parts living sphagnum and fibrous peat, with the addition of a little silver sand. The plants should be raised upon a moderate-sized cone above the rim of the pot, and then firmly pressed down. The time for repotting or surfacing is just after the flowers are past; and, as the blooming season of most of the kinds is during winter, this will come round about the middle of February. Although, as before remarked, these plants require a copious supply of water when growing, care must be taken that it does not lie in the centre of the young shoots, or they will be very apt to decay. When the growth is fully matured, an amount of moisture just sufficient to keep the pseudo-bulbs from shrivelling, will be all that is necessary.

C. asperata (rough).* *fl.* about 3in. in diameter; sepals and petals pale cream-colour; lip ground-colour the same, richly marked with chocolate and yellow streaks and veins, which radiate from a rich orange-coloured central ridge or crest; raceme pendulous, about 1ft. long, many-flowered. Summer. *h.* 2ft. Borneo. This is a large-growing species, which requires a large pot and the heat of a warm stove to attain perfection.

C. barbata (bearded).* *fl.* snow-white, large; lip trifid, with projecting triangular acute middle lacina, three rows of narrow lamellæ on the disk, and a border of ciliæ; the lamellæ, ciliæ, and the top are altogether of a sepia-brown, verging to black, which forms an exceedingly neat contrast to the white colour of the other parts of the flowers; spikes erect. Assam, 1837. This very beautiful stove species requires a continuous and abundant supply of water while growing.

C. biflora (two-flowered). *fl.* white, brown. Moulmein, 1866.

C. ciliata (ciliated).* *fl.* yellow and white, with some brown markings. Autumn. A compact-growing species, with light green leaves, and producing bulbs about 4in. high.

FIG. 492. FLOWERS OF CŒLOGYNE CORRUGATA.

Cœlogyne—*continued.*

C. corrugata (wrinkled).* *fl.*, sepals and petals pure white; lip white, with a yellow plate in front, and veined with orange; racemes erect, shorter than the leaves. Autumn. *l.* twin, about 6in. long, coriaceous. Pseudo-bulbs much corrugated or wrinkled, and apple-green in colour. India, 1866. A handsome cool-house species. See Fig. 492. (B. M 5601.)

FIG. 493. CŒLOGYNE LAGENARIA.

C. corymbosa (corymbose). *fl.* pure white. February. The flower-spikes in most instances are nicely thrown above its beautiful deep green arching foliage, whilst others nestle amongst its large pseudo-bulbs. India, 1876.

C. cristata (crested).* *fl.* fragrant, 3in. to 4in. in diameter; sepals and petals snow-white; lip white, with a large blotch of rich yellow in the middle, the veins being ornamented with a golden crest-like fringe; raceme somewhat drooping, many-flowered, about 9in. long. December to March. *l.* twin, narrow, coriaceous, dark green. Pseudo-bulbs somewhat oblong, smooth, shining, apple-green colour. Nepaul, 1837. When growing, the temperature of the cool end of the Cattleya house will suit this species admirably; but during winter, it should be kept quite cool; indeed, when in flower, it may be removed to the drawing room or parlour without fear of injury, forming there a most enjoyable and attractive ornament. It must, however, be placed in the stove again before the shoots begin to grow, or the dryness of the atmosphere may cause the growths to be stunted, and thus one season's bloom would be lost. It is extremely easy to grow. One of its many admirers says, "You may take a piece, and suspend it to a piece of copper wire in a temperate library, to the level of the nose, and it shall be to that organ, and to the eye that sees it, as agreeable three weeks hence as it is to-day, by simply taking a mouthful of pure water and giving the bulb a squirt every morning without wetting the leaves." (B. R. 27, 57.) There is a variety of this plant having a pale lemon-coloured blotch upon the lip, instead of the rich yellow colour of the normal form; and another with pure white flowers (see Warner and Williams' "Orchid Album," t. 54).

C. Cumingii (Cuming's).* *fl.*, sepals and petals white; lip bright yellow, with white down the centre. *h.* 2ft. Singapore, 1840. A very pretty species, retaining its beauty for a considerable period.

C. flaccida (flaccid).* *fl.* with a somewhat heavy odour; sepals and petals white; lip white, stained with pale yellow in front, and streaked with crimson towards its base; racemes long, pendulous, many-flowered. Winter and spring. *l.* twin, dark green, coriaceous. Pseudo-bulbs oblong. *h.* 1ft. Nepaul. An erect-growing free-flowering species, of considerable beauty. (B. M. 3318.)

C. fuscescens (dark-brownish). *fl.* large; sepals and petals of a pale yellowish-brown, tipped with white; lip edged with white and streaked with orange-yellow, and having on each side of the base two spots of cinnamon-brown; raceme slightly pendulous, few-flowered. Winter. *l.* about 9in. long, broad, dark green in colour. Pseudo-bulbs about 4in. or 5in. high. Moulmein. (G. C. 1848, 71.) A variety, *brunnea*, has pure brown flowers.

C. Gardneriana (Gardner's).* *fl.* large, pure white, saving at the base of the lip, where they are stained with lemon-colour; at the base of each is a large white fleshy bract; raceme long, nodding, many-flowered. Winter. *l.* twin, lanceolate, thin, bright green, 1ft. to 1½ft. long, 3in. wide. Pseudo-bulbs long, narrow, tapering from the base upwards, resembling long flasks. *h.* 1ft. Khasia, 1837. Stove. (P. M. B. 6, 73.)

C. Gowerii (Gower's).* *fl.*, sepals and petals snow-white; lip also white, having three parallel raised lines and a lemon-coloured blotch on the disk; raceme pendulous, many-flowered. Winter and spring. *l.* lanceolate, about 6in. long, bright green. Pseudo-bulbs ovate, shining green. Assam, 1869. A rare but lovely small-growing species, suitable for cultivation on a block of wood. It requires cool treatment.

C. Hookeriana (Hooker's).* *fl.* rose-purple, white, brown, yellow. May. *h.* 3in. Sikkim, 1878. A pretty little species of the *Pleione* section, differing from most of its fellows by producing its leaves and flowers simultaneously. SYN. *Pleione Hookeriana.*

C. humilis (humble).* *fl.* solitary, 3in. in diameter; sepals and petals white, faintly, or somewhat deeply, tinged with rose-colour; lip white, spotted and streaked with crimson and brown, and traversed by six parallel veins, which are fringed, as is also the border. Late autumn. *l.* plaited, dark green. Pseudo-bulbs ovate, dark green. Nepaul, 1866. SYN. *Pleione humilis.* (B. M. 5674.) There is a variety with yellow spots and stains on lip.

C. lagenaria (bottle-shaped). *fl.* solitary; sepals and petals lilac or rose-colour; lip large, white, striped and barred with rich crimson and yellow, and waved and crisped at the margin; scape springing from the very base of the pseudo-bulb. *l.* solitary, thin, plaited, about 6in. long. Pseudo-bulbs somewhat flask or bottle-shaped, flattened below the conical neck, and there lapping over, like the lid of a box; dark green, mottled brown, wrinkled. Khasia, 1856. SYN. *Pleione lagenaria.* See Fig. 493. (B. M. 5370.)

C. maculata (spotted).* *fl.*, sepals and petals white; lip white, beautifully barred with crimson; bracts pale green, inflated. October, November. *l.* 6in. long. Pseudo-bulbs depressed at the top, forming a kind of ring around a short thick beak, whence the leaves have fallen; partly clothed with brown scales. Khasia, Assam, &c., 1837. SYNS. *Gomphostylis candida* and *Pleione maculata.* (B. M. 4691.)

FIG. 494. CŒLOGYNE ODORATISSIMA.

Cœlogyne—*continued.*

C. Massangeana (Massange's).* *fl.*, sepals and petals light ochre-coloured; lip trifid, beautiful maroon-brown, with ochre-coloured veins; raceme pendulous, many, but loosely, flowered. Pseudo-bulbs pyriform, bearing two Stanhopea-like leaves. 1879. Stove. This species is closely allied to *C. asperata*. (F. M. n. s. 373.)

C. media (middle).* *fl.* on spikes 10in. high; sepals and petals creamy-white; lip yellow and brown. Khasia, 1837. A pretty small-growing winter-flowering species, with short round pseudo-bulbs, and leaves 7in. long.

C. ocellata (eyed).* *fl.*, sepals and petals pure white; lip curiously fringed or crested, white, streaked and spotted with yellow and brown at the base; side lobes with two bright yellow spots on each; column bordered with bright orange; racemes upright. March and April. *l.* long, narrow, bright green, longer than the racemes. Pseudo-bulbs ovate. India, 1822. A very pretty species, well adapted for block culture. (B. M. 3767.) The variety *maxima* is a very handsome form, with a raceme of about eight star-like flowers; the segments lanceolate; lip saddle-shaped, with a terminal lobe marked with yellow. 1879.

C. odoratissima (very sweet-scented).* *fl.* pure white, excepting the centre of the lip, where they are stained with yellow, sweet-scented; raceme slender, pendulous. Winter. *l.* twin, pale green, lanceolate, about 4in. long. Pseudo-bulbs thickly clustered together, about 1in. high. India, 1864. This species grows freely if not kept too warm, and will probably succeed perfectly in a cool orchid house. See Fig. 494. (B. M. 5462.)

C. pandurata (fiddle-shaped).* *fl.* upwards of 3in. in diameter, very fragrant; sepals and petals of a very lively green; lip of the same colour, having several deep velvety black raised ridges or crests running parallel upon its surface, oblong, but curiously bent down at the sides, thus assuming somewhat the form of a violin; raceme pendulous, longer than the leaves, many-flowered. June, July. *l.* bright shining green, 1ft. to 1½ft. long. Pseudo-bulbs large, broadly ovate, compressed at the edges. *h.* 1½ft. Borneo, 1853. A very curious and distinct flowering stove species. (B. M. 5084.)

C. Parishii (Parish's). *fl.* yellow, brown. Moulmein, 1862. (B. M. 5323.)

C. plantaginea (Plantain-leaved).* *fl.* greenish-yellow; lip white, streaked with brown. *h.* 1½ft. India, 1852. A distinct and pretty species.

C. Reichenbachiana (Reichenbach's). *fl.* large, produced in pairs; sepals and petals rose-coloured; lip rose, but shaded with purple and fringed in front with crimson. Autumn. Pseudo-bulbs larger than in any other known species, and peculiarly netted. Moulmein, 1868. A rare and very distinct species. SYN. *Pleione Reichenbachiana*. (B. M. 5753.)

C. Rhodeana (Rhode's). *fl.* white, fragrant; lip brown. Moluccas, 1867.

C. Schilleriana (Schiller's).* *fl.* solitary, 3in. long; sepals and petals yellow, lanceolate; lip oblong, contracting in the middle, expanding into a roundish two-lobed lamina, marked with regular purplish blotches. June. *l.* oblong-lanceolate, tapering to a stalk. Pseudo-bulbs small. *h.* 6in. Moulmein, 1858. (B. M. 5072.)

C. speciosa (showy).* *fl.* upwards of 3in. in diameter, mostly produced in pairs at the end of a slender peduncle; sepals and petals brownish or olive-green, the latter very long, and narrower than the sepals; lip very beautiful, both in the colour and marking, and in the exquisite fringe of the crests and margin, ground-colour yellow, variously veined with dark red, base dark brown, apex pure white. Hooker describes the peculiar lip as follows: "The form is oblong; it is three-lobed, the lateral lobes small, resembling ears, the latter and the margin of the broad two-lobed middle lobe or segment fringed. Two long crests run nearly the whole length of the lip; these are copiously fringed with pedunculated stellated hairs, and are beautiful objects for the microscope." *l.* solitary, oblong-lanceolate, thin, dark green. Pseudo-bulbs somewhat oblong. *h.* 1½ft. Java, 1845. This species is almost a perpetual blossomer. (B. M. 4889.)

C. sulphurea (sulphur-coloured).* *fl.* yellowish-green; lip white, with yellow streaks; column with a yellow blotch at its base; racemes few-flowered. Java, 1871.

C. viscosa (viscid).* *fl.*, sepals and petals white; lip white, having side-lobes broadly streaked with rich brown. Summer. *l.* dark green, tapering towards the base. Pseudo-bulbs fusiform in shape. India, 1870. A rare species, not very unlike *C. flaccida*.

C. Wallichiana (Wallich's).* *fl.* about 3in. across, sweet-scented, usually solitary; sepals and petals large, bright rose-coloured; lip of a similar hue, but striped in the centre with bands of pure white. Khasia, 1837. A very handsome dwarf species. SYN. *Pleione Wallichiana*. (B. M. 4496.)

CŒRULESCENT. Bluish.

COFFEA (from *Coffee*, a province of Narea, in Africa, where the common Coffee grows in abundance). Coffee-tree. ORD. *Rubiaceæ*. Stove evergreen trees and shrubs. Corolla tubular, funnel-shaped, with a spreading four to five-parted limb, and oblong lobes. Leaves opposite; stipules interpetiolar. They thrive in a mixture of turfy loam and sand; and require plenty of water, and ample pot room. Ripe cuttings strike freely in sand, under a hand glass, in a moist heat; and the young plants so raised produce flowers and fruit more readily than those grown from seed.

Coffea—*continued.*

C. arabica (Arabian).* *fl.* white, sweet-scented, disposed in axillary clusters of four to five. September. *l.* oval-oblong, wavy, dark green and shining above, paler beneath, acuminated. *h.* 5ft. to 15ft. Truly native in the mountainous regions of South-west Abyssinia, 1696. (B. M. 1303.)

C. benghalensis (Bengal). *fl.* white, solitary or in pairs at the extremity of the branches; corolla hypocrateriform, with a slender tube. *l.* opposite, ovate, acuminate, entire, spreading, remote, almost sessile. Branches dichotomous. Assam. (B. M. 4917.)

C. liberica (Liberian). * *fl.* white, sweet-scented. *l.* similar in outline to, but very much larger than, those of Arabian Coffee. Liberia, 1875. The plant altogether is much more robust, and can be grown in hot localities in which the older *C. arabica* would not thrive. (G. C. n. s. 6, 105.)

C. travancorensis (Travancore). *fl.* white, fragrant, solitary, or three or four together in the axils of the leaves, shortly pedicelled, erect. *l.* variable in shape, from broadly ovate to lanceolate, obtuse, acute, or drawn out into a long obtuse or acute point. Branches slender, obscurely quadrangular. *h.* 3ft. to 6ft. Southern India, 1844. (B. M. 6749.)

COFFEE-TREE. *See* **Coffea.**

COHERING. Connected.

COIX (a name applied by Theophrastus to a reed-leaved plant). Job's Tears. ORD. *Gramineæ*. A small genus of curious grasses, chiefly requiring stove heat. The only species usually grown is *C. lachryma*, which is a native of India, and grows from 2ft. to 4ft. high. This is cultivated out of doors in summer, and its peculiar

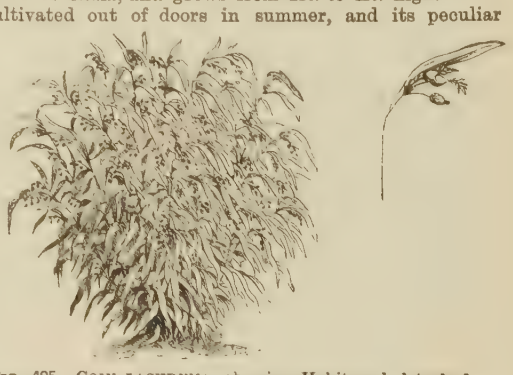


FIG. 495. COIX LACHRYMA, showing Habit and detached Inflorescence.

heavy grey pearly seeds, which hang in clusters out of the sheath, give the plant quite an unique appearance. The seeds, which are about the size of a Cherry-stone, and are very hard, should be sown in heat, in February or March, or later on out of doors. See Fig. 495.

COLA (its native name). ORD. *Sterculiaceæ*. A stove evergreen tree, requiring a rich, light, loamy soil. Increased by seeds (which are about the size of a pigeon's egg); also by ripened cuttings, placed in sand, under a hand glass, in bottom heat.

C. acuminata (pointed). Cola or Goora Nut. *fl.* yellow, numerously disposed in axillary corymbose racemes. January. *l.* coriaceous, oblong-ovate, acuminated. Tropical Africa, 1868. The seeds are universally used as a condiment by the negroes of West tropical Africa and the West Indies. They are also employed in medicine, and to render putrid water wholesome. (B. M. 5699.)

COLAX. *See* **Lycaste.**

COLBERTIA. *See* **Dillenia.**

COLCHICEÆ. A tribe of *Liliaceæ* which takes its name from the principal genus, *Colchicum*, the other three genera being *Bulbocodium*, *Merendera*, and *Synsiphon*.

COLCHICUM (Colchis, in Asia Minor, is its native country). Meadow Saffron. TRIBE *Colchiceæ* of ORD. *Liliaceæ*. A genus of autumn or rarely spring-flowering

Colchicum—*continued.*

plants, allied to *Bulbocodium*, but with larger and broader leaves, which do not appear till spring. Stamens six; styles three, free, filiform; ovary deeply three-grooved. Colchicums are among the most beautiful of autumnal flowering plants, and their cultivation is of the easiest. Some growers lift annually, and store them for a month or six weeks in a dry place before planting; but this is not a good practice, as in no case must it be done till the leaves die down, which is often not before June or July; and, at the latest, they ought to be planted in August. There is less need to lift these than Crocuses, as they require little or no division. The best soil is a light sandy loam, enriched with thoroughly decomposed manure; and a rather moist situation is most favourable. On dry soils, they often suffer considerably in hot summers. Colchicums look best in masses, and should be planted not less than 3in. deep. Propagation is effected by increase of corms; or by seed, which are usually produced freely, and generally ripen in June or July. It is best to sow them as soon as ripe, or in any case not later than September. A warm, sheltered place, out of doors, should be selected, and the seed covered with ½in. of fine soil. The seed may come up during the winter, or may not vegetate till the following spring.

The choice or rare varieties may be sown in pans, and be placed for the winter in a cold pit or frame. It is well to sow thinly, so as to be able to leave the seedlings for two years in the seed pans. Throughout the summer, water carefully in dry weather up to the end of July, or until the tiny plants show signs of resting. After two years, plant out the bulbs in nursery beds, from 4in. to 6in. apart, and leave them alone till they flower, which will be in from three to five years from the time of sowing. The common Meadow Saffron (*C. autumnale*) and its varieties are most largely grown. The species itself may be purchased in large quantities tolerably cheap.

C. alpinum (alpine). *fl.* deep rose-colour, bell-shaped. Autumn. *l.* linear, erect, 2in. to 2½in. long, narrowed at the base, appearing in February and March. Corm small, one (rarely two) flowered. *h.* 1in. to 2in. Mountains of South-east France and Switzerland, 1820. SYN. *C. montanum.* (A. F. P. 1, 74, not of Linnæus.)

C. arenarium umbrosum (sand and shade loving). A synonym of *C. umbrosum.*

FIG. 496. COLCHICUM AUTUMNALE.

C. autumnale (autumn-flowering).* *fl.* bright purple, numerous, with very long tubes. Autumn. *l.* erect, lanceolate, dark green, 6in. to 1ft. long, and usually 1in. or more broad, appearing after the flowers. Corm large, egg-shaped. *h.* 4in. Europe (Britain). See Fig. 496. (Sy. En. B. 1544.) Of this species the varieties are very numerous, the best being: ALBUM, ATROPURPUREUM, DOUBLE PURPLE, DOUBLE WHITE, and STRIATUM.

C. Bivonæ (Bivone's).* *fl.* prettily marked with alternate checkers of white and purple, chess-board like, radical; segments of the perianth elliptical-oblong. Autumn. *l.* linear, grooved. South Europe.

C. bulbocodioides (Bulbocodium-like). A synonym of *C. montanum.*

C. byzantinum (Byzantine).* *fl.* pale rose-colour, six to nine to each bulb; segments elliptical-oblong. Autumn. *l.* broad, undulating, plaited, dark green, four or five. Corm large, roundish, depressed. *h.* 3in. to 4in. Levant, 1629.

C. chionense (Chios). A synonym of *C. variegatum.*

C. luteum (yellow).* *fl.* yellow, 3in. to 4in. high, with ovate perianth segments. Spring. *l.* narrow, linear-ligulate, obtuse, concave, bright green. Kashmir and Afghanistan, 1874. (B. M. 6153.)

C. montanum (mountain).* *fl.* lilac-purple or nearly white. February and March. *l.* short, narrow, lanceolate or linear, falcate,

Colchicum—*continued.*

FIG. 497. COLCHICUM MONTANUM.

reaching about as high as, and developing simultaneously with, the flowers. *h.* 3in. to 4in. Mediterranean region, 1819. SYN. *C. bulbocodioides.* See Fig. 497.

C. montanum (mountain). A synonym of *C. alpinum.*

FIG. 498. COLCHICUM PARKINSONI.

C. Parkinsoni (Parkinson's).* *fl.* white, tessellated and barred with purple. Autumn. *l.* ovate-lanceolate, wavy. Greek Archipelago, 1874. See Fig. 498. (B. M. 6090.)

C. speciosum (showy). *fl.* clear red-purple, varying to deep crimson-purple, with a white throat; tube long; perianth divisions oval. September and October. *l.* 1ft. long by 2in. to 4in. broad, elliptic, sub-erect, narrowed to the obtuse apex. Caucasus. The largest known species of the genus. Fig. 499 shows the habit and foliage. (B. M. 6078.)

C. umbrosum (shade-loving). *fl.* violaceous-purple, long-tubed. Autumn. *l.* ligulate-lanceolate, fleshy, three or many, alternate. Capsule membranaceous, oblong, acuminate, three-lobed. *h.* 4in. Crimea. SYN. *C. arenarium umbrosum.* Like most of the genus, this species produces no leaves at the time of flowering; but soon afterwards they appear, and attain in spring a length of several inches. (B. R. 541.)

C. variegatum (variegated). *fl.* rose-colour, marked with purple-violet checkers; segments lanceolate, acute. Autumn. *l.* oblong-lanceolate, channelled, margins wavy. Corm large, egg-shaped. *h.* 3in. Greece, 1629. SYN. *C. chionense.* (B. M. 1028.) There are two or three forms of this species.

Colchicum—*continued.*

FIG. 499. COLCHICUM SPECIOSUM.

COLDENIA (named after Conwallades Colden, a North American botanist, who discovered numerous new plants; these are published in the Upsal Acts for 1743). ORD. *Boragineæ*. A genus containing about ten species of branched prostrate herbaceous plants, natives of both the Old and New Worlds. Perhaps the only one in cultivation is *C. procumbens*—an ornamental stove trailing annual. Seed should be sown in March, in a hotbed, and the seedlings planted out singly in pots when large enough to handle. It requires a light, rich soil.

C. procumbens (procumbent). *fl.* white, axillary, usually solitary, sessile; corolla funnel-shaped; throat wide, naked; limb flat. July. *l.* alternate, cuneiform, petiolate, having one of the sides shorter than the other, coarsely serrated, plicate, beset with appressed hairs above. India, 1699.

COLEA (named in honour of General Sir G. Lowry Cole, a governor of the Mauritius). ORD. *Bignoniaceæ*. Stove evergreen shrubs. Calyx sub-campanulate, five-toothed; corolla funnel-shaped; limb divided into five spreading lobes. Fruit oblong, fleshy, indehiscent. Leaves imparipinnate, bi- or many-jugate. They thrive in a compost of peat and loam, both of a fibry texture, and mixed with a little sand and charcoal. Cuttings of ripe shoots will root in sand, if placed in a moist bottom heat, and covered with a glass.

C. Commersoni (Commerson's). A synonym of *C. undulata*.

C. floribunda (abundant-flowering).* *fl.* yellowish-white, in fascicles, nearly sessile, rising from the old wood. August. *l.* pinnate, verticillate, eight pairs; leaflets oblong-lanceolate, pointed. *h.* 10ft. Mauritius, 1839. (B. R. 27, 19.)

C. undulata (undulated). *fl.* yellow and lilac, in racemes from old wood. Summer. *l.* whorled, pinnate, 2ft. to 4ft. long. Stem simple. Madagascar, 1870. SYN. *C. Commersoni*. (R. G. 669.)

COLEBROOKIA (named after Henry Thomas Colebrooke, F.R.S., F.L.S., &c., an accomplished botanist). ORD. *Labiatæ*. This genus contains only the two plants described below, and these probably are but forms of one species. Greenhouse evergreen shrubs, densely clothed with whitish or sub-rufous woolly tomentum. Flowers white, small; corolla tubular, contracted in the middle; cymes of whorls distinct, head-formed, dense, sessile. Leaves petiolate, oblong-elliptic, crenulated. Spikelets 1in. to 3in. long, pedunculate, panicled. They thrive in

Colebrookia—*continued.*

a compost of one part peat and two parts loam, with a small quantity of sand added, to keep the whole porous. Cuttings of half-ripened shoots, made in April or May, will root in sand, under a bell glass.

C. oppositifolia (opposite-leaved). Branches, leaves, and spikes opposite. *h.* 3ft. to 4ft. Nepaul, 1820. (S. E. B. 115.)

C. ternifolia (ternate-leaved). Branches, leaves and spikes three in a whorl. Leaves more tomentose, and on shorter petioles, than in the first species, and spikelets more dense. India, 1823.

COLEONEMA (from *koleos*, a sheath, and *nema*, a filament; the filaments are fixed into sheath-like recesses of the petals). ORD. *Rutaceæ*. Very ornamental small Heath-like greenhouse shrubs, from the Cape of Good Hope. Flowers white, axillary towards the top of the branches, solitary, on short peduncles. Leaves short, linear, scattered, very acute, beset with glandular dots. There are four species, all natives of South-west Africa. For culture, *see* **Diosma.**

C. album (white). *fl.* white, small. Autumn and winter. *l.* sub-erect, linear-lanceolate, channelled above, with a straight, pungent mucro. *h.* 1ft. to 2ft. A small erect, nearly glabrous, shrub.

C. aspalathoides (Aspalathus-like). *fl.* white. Autumn. *l.* linear, keeled and sub-triangular, with a recurved mucro. *h.* 6in. to 3ft.

C. juniperinum (Juniper-like). *fl.* white. Autumn. *l.* narrow linear, with a short, straight mucro, concave above, convex underneath, shining. *h.* 1ft. to 2ft.

C. pulchrum (beautiful). *fl.* large, red. Autumn. *l.* spreading or recurved, linear, with a straight, pungent mucro, the diaphanous margin serrulate. *h.* 2ft. to 4ft. (B. M. 3340.)

COLEOPTERA. *See* **Beetles.**

COLEUS (from *koleos*, a sheath; in allusion to the filaments being connected, and forming a tube at the base, which sheathes the style). ORD. *Labiatæ*. A genus of stove herbs, annual or perennial at the base, rarely suffruticose. Whorls usually six-flowered, but often many-flowered, sometimes very dense, and sometimes loose, cyme-formed. The monadelphous stamens distinguish this genus from all others of the order. The foliage of the hybrid varieties and sports of Coleus are unsurpassed for beauty of colour; and, whether grown as large or small plants, they are extremely useful for decorative purposes. Their culture is very simple, but unless a minimum temperature of 55deg. is maintained, they cannot be wintered safely. Where such conditions do not obtain, it is better to purchase plants in spring, grow them on for the season, and then throw them away.

Coleus thrive well in a compost of one-half rotten turf, obtained from an old pasture, one-fourth thoroughly rotted cow manure, and the remainder of sharp sand and leaf soil in equal proportions. Pot moderately firm, and water freely when growth has commenced, giving occasional doses of liquid manure when established, especially during hot weather, as the plants then grow very rapidly. Plenty of air and light must be afforded in summer, in order to keep the plants strong and short-jointed. Care must also be taken that they do not suffer for want of water, or the lower leaves will drop off, and thus render them unsightly. Coleus grown for exhibition should be of globular or pyramidal form, with the lower leaves covering the edge of the pot, so that neither bare stems nor soil are visible. When grown for ordinary decoration, useful plants may be obtained, and the colours in the leaves more highly developed, by cultivating in comparatively small pots. Those of 5in. or 6in. diameter are large enough to produce good-sized plants that are indispensable for greenhouse or any indoor decorations in summer and autumn. Being of quick growth, and very easily propagated, the loss of a Coleus when used in decorating is of little consequence, compared with the majority of other plants. The flowers of the foliage kinds are insignificant, and the spikes, when seen, should be pinched out. The cultivation above recommended also suits the green-leaved species; but, after a few pinchings, to secure bushy plants,

Coleus—*continued.*

they should be allowed to develop their flowers, some of which are highly ornamental. Cuttings strike with the greatest freedom at almost any time of the year, and, with a good moist heat, will quickly form fine specimens. They are best placed separately in small pots, and, when rooted, may be potted on, allowing a liberal shift each time. Coleus may also be increased by seed; but this method is only adopted for raising new varieties.

C. Verschaffeltii, a variety of *C. Blumei*, is much grown for bedding purposes, and is especially employed in large carpet-bedding designs; it is one of the most effective crimson-leaved subjects for the purpose, and, arranged with Centaurea or Golden Feather, is very striking.

C. barbatus (bearded). *fl.* brownish, with the lower lip nearly ovate, compressed, and hairy; racemes terminal. November. *l.* oval, scalloped, downy and wrinkled, gradually narrowed into the footstalk. Stem quadrangular. *h.*2ft. Abysinnia. Perennial. Every part of the plant has a powerful fragrance. (A. B. R. 594.) SYN. *Plectranthus barbatus.*

C. Blumei (Blume's). *fl.* white and purple, disposed in a terminal elongated whorled spike or raceme. *l.* rhomboidal ovate, membranous, deeply and coarsely inciso-serrate at the margin, the apex acuminate, entire as well as the base; yellowish-green in colour, the whole disk dark purple or sanguineous, breaking into spots near the margin. *h.* 1ft. to 1½ft. Java. Perennial. It is from this species that the innumerabe variegated forms (so extensively grown for decorative purposes) including *Verschaffeltii*, have originated. (B. M. 4754.)

C. Colvillei (Colville's). A synonym of *Plectranthus coleoides.*

C. inflatus (inflated). *fl.* lilac, disposed in compound, subracemose spikes. December. *l.* on long petioles, opposite, ovate, sharply acuminated, very coarsely serrated. Stems and branches square; the base of the stem scarcely woody, often tinged with orange-colour and spotted with red. *h.* 3ft. Ceylon. Perennial. (B. M. 5236.)

C. Macraei (Macrae's). *fl.* variegated with white and dark purple, disposed in a large terminal panicle; corolla very curious in the sudden geniculation near the middle of the tube, in the ample and compressed throat, and especially in the large boat-shaped lower lip. Summer. *l.* ovate, acuminate, serrated, dark green above, beneath deeply purple, as are the petioles. Stems quadrangular, dark purple, branched, with opposite branches. *h.* 2ft. to 3ft. Ceylon, 1852. Perennial. (B. M. 4690.)

C. scutellarioides (Scutellaria-like). *fl.* blue, with the lower lip white and quadrifid; disposed in verticillate racemes. *l.* lanceolate-ovate, serrate, light green above, underneath brownish, as is also the stem. East Indies, North Australia, &c. A tall herb or under-shrub. SYN. *Ocimum scutellarioides.* (B. M. 1446.)

The varieties of this genus are innumerable, and a number are added each year. The following is a selection of the best kinds now in cultivation; the descriptions refer to the leaves:

ADA SENTANCE, highly coloured, good; ALLEN CHANDLER, light crimson, self-coloured, good; DISPLAY, bright magenta-crimson, blotched bronze, broadly margined with green; DUCHESS OF EDINBURGH, very dark, margined and blotched with magenta; EDITH SENTANCE, large, blotched crimson, green edge, showy; H. A. MANN, creamy-white, tinted rosy-pink; HARRY VEITCH, pale crimson and yellow, crimpled foliage; JAMES BARNSHAW, good; J. F. PAWLE, crimson, pale yellow margin; KENTISH FIRE, purplish-crimson, much divided, good; LADY BURRELL, extra fine; MISS ROSINA, magenta-crimson and yellow, highly coloured; MISS SIMPSON, extra fine; MR. G. SIMPSON, dark velvety crimson, self, one of the most distinct and best; MRS. SHARMAN, irregularly marked, yellow and crimson; MRS. STEDDALL, vivid crimson and pale green, small, fine and showy; MRS. VAUGHAN, dark crimson, broad band of pale yellow; PICTUM, small, deeply cut, pretty; PILLAR OF GOLD, much divided, yellow, tinted rose; POMPADOUR, large, prettily mottled with many colours, very distinct and good; RENOWN, light green, reticulated and irregularly mottled with dark maroon; SHAH, rose-crimson and yellow, broad, good; SUNBEAM, green, veined yellow, distinct.

COLEWORT. A name applied to varieties of the white Cabbage, before the hearts become solid.

COLLETIA (named after Philibert Collet, a French botanical writer, 1643-1718). ORD. *Rhamneæ.* Much-branched greenhouse or half-hardy shrubs. Petals absent, or very minute; calyx campanulate, coloured. Leaves, when present, simple, opposite, stipulate, deciduous, very minute, entire. Branches divaricating, decussately opposite; branchlets spiny. They are extremely curious plants, and are best grown in sheltered, isolated positions, where their peculiar character can be readily seen. A good loamy soil is most suitable. Cuttings of half-ripened wood, 6in. to 8in. in length, will root readily in well-drained pots of sandy soil, in a cool greenhouse; they should then be placed in a close, cold frame, until fully established.

Colletia—*continued.*

C. armata (armed). A synonym of *C. spinosa.*

C. Bictonensis (Bicton). A synonym of *C. cruciata.*

C. cruciata (cruciform). *fl.* solitary. *l.* very few, elliptic, quite entire. Stem very prickly; spines decussate, compressed laterally, broad, ovate acute, decurrent. *h.* 4ft. Rio de la Plata, 1824. SYN. *C. Bictonensis.* (B. M. 5033.)

C. ferox (fierce). A synonym of *C. spinosa.*

C. horrida (horrid). A synonym of *C. spinosa.*

C. polyacantha (many-spined). A synonym of *C. spinosa.*

C. serratifolia. *See* **Discaria serratifolia.**

C. spinosa (spiny). *fl.* in scattered fascicles; calyx urceolate; filaments elongated, exserted. May to July. *l.* elliptic, quite entire; spines very strong, awl-shaped. *h.* 3ft. to 10ft. Chili and Peru, 1823. SYNS. *C. armata, C. ferox, C. horrida, C. polyacantha, C. valdiviana.* (G. C. n. s., viii., p. 616.)

C. ulicina (Ulex-like). *fl.*, calyx elongated, cylindrical; fascicles crowded at the tops of the branches. Spines slender, very numerous. *h.* 2ft. to 4ft. Chili.

C. valdiviana (Valdivian). A synonym of *C. spinosa.*

COLLIER. A common name of the **Black Fly** (which *see*).

COLLINSIA (named after Zaccheus Collins, once Vice-President of the Academy of Natural Sciences of Philadelphia). ORD. *Scrophularineæ.* A small genus of about a dozen species of very pretty hardy annuals. Flowers brightly-coloured; corolla tube saccate at the base on the upper side. Leaves entire, opposite, rarely verticillate. These are excellent subjects for growing in patches and clumps; and are of very easy culture in any ordinary garden soil. Seed should be sown in the open border, late in March, or in April, and the seedlings thinned out to about 2in. apart. For spring flowering, the seed should be sown in a sheltered place during autumn, and the young plants protected, if necessary, during the winter, with a handlight, or matting.

FIG. 500. COLLINSIA BICOLOR, showing Entire Inflorescence and Single detached Flower.

C. bicolor (two-coloured).* *fl.* large; upper lip and tube of corolla white; lower lip rosy-purple; pedicels verticillate, racemose. August. *l.* glabrous, ovate-lanceolate, sub-cordate at the base. Stem erect, downy. *h.* 1ft. California, 1833. See Fig. 500.

C. corymbosa (corymbose). *fl.* numerous, disposed in an umbel-like manner; lower lip of corolla white, upper one grey-blue, very short. *l.* ovate, stalked; upper ones sessile. Habit dwarf much branched. Mexico, 1868. (R. G. 1868, 568.)

Collinsia—*continued.*

C. grandiflora (large-flowered).* *fl.*, corolla pale purple, dilated, retuse; upper lip blue; pedicels verticillate. May to July. *l.*, lower ones spathulate; superior ones oblong-linear. *h.* 1ft. Columbia, 1826. (B. R. 1107.)

C. parviflora (small-flowered). *fl.* purple, blue. June. *h.* 1ft. California, &c., 1825. Trailer. (B. R. 1082.)

C. sparsiflora (scattered-flowered). *fl.* violet. May. *h.* 1ft. California, 1836.

C. tinctoria (dyers'). *fl.* pale pink. May. *h.* 1ft. California, 1848.

C. verna (spring).* *fl.*, corolla white; lower lip blue; pedicels axillary, solitary. May. *l.* lanceolate. Stem erect, a little branched. *h.* 1ft. Eastern United States, 1855. (B. M. 4927.)

C. violacea (violet). *fl.*, corolla bright violet; upper lip paler. *l.* ovate-lanceolate, and remotely denticulated. *h.* 3in. to 1ft. Arkansas, &c., 1871.

COLLINSONIA (named in honour of Peter Collinson, F.R.S., a well-known patron of science and correspondent of Linnæus; he first introduced this and a host of other plants to English gardens). ORD. *Labiatæ*. Strong-scented, rather coarse-growing, hardy herbaceous plants or shrubs. Flowers pedicellate, solitary; pedicels opposite, disposed in simple, but usually paniculately-branched, racemes; corolla exserted, sub-campanulate. They grow well in common garden soil, but prefer sandy peat, and a moist situation. Propagated readily by dividing the roots, in spring.

C. anisata (Anise-scented).* *fl.* pale yellow; panicle dense. September. *l.* broad-ovate, a little toothed, roundly truncate at the base, wrinkled, pubescent on the nerves beneath, and on the stems, which are a little branched. *h.* 2ft. to 3ft. South United States, 1806. This species requires protection from severe frosts. (B. M. 1213.)

C. canadensis (Canadian). *fl.*, corolla yellow, four times longer than the calyx; panicles elongated, loose, many-flowered. August. *l.* broad-ovate, acuminate, rounded at the base, sub-cordate, glabrous. Stems branched, glabrous, or a little downy. *h.* 1ft. to 2ft. North America, 1734. This hardy perennial has a peculiar scent, which is agreeable, but very strong.

COLLOMIA (from *kolla*, glue; in reference to the seeds being enveloped in a mucilaginous substance, of a most remarkable character). ORD. *Polemoniaceæ*. This genus is allied to *Gilia*, and contains about a dozen species of very pretty hardy annuals. Flowers disposed in dense heads, propped by broad, ovate, quite entire bracts; corolla salver-shaped. Leaves alternate, the lower ones rarely opposite, rarely pinnatifid. They are of very easy culture in ordinary soil, and may be treated like **Collinsia** (which *see*).

C. Cavanillesii (Cavanilles'). A synonym of *C. grandiflora*.

C. coccinea (scarlet).* *fl.* deep red; corolla more than twice as long as the calyx. June to October. *l.* lanceolate linear; upper ones ovate-lanceolate, quite entire, or deeply two to four-toothed at the apex. *h.* 1ft. to 1½ft. Plant erect, branched, beset with glandular down. Chili, 1831. SYN. *C. Cavanillesii*. (B. R. 1622.)

C. grandiflora (large-flowered).* *fl.* of a very uncommon reddish-yellow colour, disposed in hemispherical, pruinose, clammy heads; corolla ventricose. June to October. *l.* oblong-lanceolate, entire, shining, ciliated with glands. Plant erect, branched, rather downy at top. *h.* 1½ft. to 2ft. North-west America, 1826. (B. R. 1174.)

C. heterophylla (various-leaved). *fl.* purplish, few, in sessile heads. Summer. *l.* alternate, petiolate, deeply and doubly pinnatifid; the segments lanceolate, rather acute, pubescent. *h.* 1ft. to 1½ft. North-west America, 1828. (B. M. 2895.)

C. linearis (lined). *fl.* yellowish-brown, in dense, sessile, terminal heads, surrounded by an involucre of the uppermost leaves. May to July. *l.* linear-lanceolate, lanceolate, or broadly lanceolate, the shorter ones almost ovate, alternate, patent, sessile, waved, entire. *h.* 1ft. to 1½ft. North-west America, 1828. An erect, much-branched annual. (B. M. 2893.)

COLOCASIA (from *kolokasia*, the Greek name for the root of an Egyptian plant). ORD. *Aroideæ* (*Araceæ*). A small genus of stove herbaceous plants, with a perennial tuberous or creeping rhizome. Flowers unisexual; the females at the base of the spadix, separated from the males by short ovoid neutral organs; spathe with a convolute persistent base; the lamina long-lanceolate, deciduous. Scapes and leaves radical; the lamina often very large, cordate or peltate, undivided. For culture, *see* **Caladium.**

Colocasia—*continued.*

FIG. 501. COLOCASIA ANTIQUORUM.

C. antiquorum (ancient).* Taro. *fl.*, spathe green, with the lamina or blade 6in. or more long, much longer than the spadix. *l.* ovate, more or less peltate and cordate, often above 1ft. long and broad. *h.* 2ft. East Indies (cultivated in South Europe and throughout the tropics), 1551. See Fig. 501.

FIG. 502. COLOCASIA ESCULENTA.

Colocasia—*continued.*

C. esculenta (edible).* *fl.* whitish; spadix shorter than the ovate-lanceolate spathe. *l.* peltate-cordate. *h.* 2ft. Sandwich Islands, &c., 1739. This fine species has been used with great success in sub-tropical gardening in the midland and southern counties. For this purpose, it should be planted out early in June, in thoroughly drained, warm, light and rich soil. In very hot weather, a plentiful supply of water must be administered, and occasionally liquid manure. On the approach of frost, all the leaves, except the central one, must be cut down to within 2in. of the crown. A few days after this operation, the tubers should be taken up, exposed for a few hours to the air, to become dry, and then stored away for the winter in the greenhouse, or any other frost and damp proof situation. SYN. *Caladium esculentum.* See Fig. 502.

C. indica (Indian).* *fl.* brownish; spadices axillary. *l.* ovate, bifid at base, rounded. Plant caulescent, sub-erect. *h.* 5ft. Sandwich Islands, &c., 1824. SYN. *Arum indicum.*

C. nymphæifolia (Nymphæa-leaved). *fl.*, spadix longer than the white cylindrical spathe, sagittate at the end. *l.* peltate-cordate, sagittate. Plant stemless. India, 1800.

C. odorata (fragrant).* *fl.* very fragrant; spadix as long as the white cymbiform spathe. *l.* cordate, with rounded lobes, 3ft. long. Plant caulescent. Peru, 1818. See Fig. 503.

FIG. 503. COLOCASIA ODORATA.

COLOGANIA (named after a family of the name of Cologan, who resided at Port Orotava, in Teneriffe, and from whom men of science visiting that island experienced the greatest hospitality). ORD. *Leguminosæ.* Stove procumbent or twining shrubs, beset with retrograde hairs. Flowers solitary, axillary, pedunculate, or in short racemes. Leaves pinnately trifoliolate, rarely one or five-foliolate. For culture, *see* **Clitoria.**

C. biloba (two-lobed). *fl.* violet, racemose. *l.* ternate, clothed with adpressed hairs. *h.* 20ft. Summer and autumn. Mexico. Conservatory. SYN. *Glycine biloba.* (B. R. 1418.)

C. Broussonetii (Broussonet's). *fl.* violet, twin, shortly pedicellate; calyx villous, rather five-cleft. *l.*, leaflets ovate-oblong, mucronate, rather strigose on both surfaces, paler beneath. Mexico, 1827.

Other species quoted as being in cultivation are: *angustifolia* and *pulchella.*

COLQUHOUNIA (named after Sir Robert Colquhoun, Bart., at one time resident at Kumaon). ORD. *Labiatæ.* Elegant and curious evergreen, twining or scandent, usually tomentose, not pilose, shrubs; well fitted for ornamenting rafters in greenhouses or conservatories. Whorls loose, axillary, or approximating into a terminal spike; bracts minute; corolla bilabiate, with an exserted incurved tube, and a dilated throat, naked inside. Leaves rather large, crenate; those of the upper parts of the branches, near the inflorescence, reduced to small bracts.

Colquhounia—*continued.*

A light rich soil, or one composed of equal parts loam, sand, and leaf mould, suits them well. Young cuttings will root readily, in the same kind of compost, under handlights, in summer.

C. coccinea (scarlet).* *fl.*, corolla scarlet, twice the length of the calyx; whorls few-flowered, approximating into a spike, which is leafy at the base. September. *l.* nearly glabrous, roughish, ovate, acuminated, 3in. to 4in. long. Nepaul. (B. M. 4514.)

C. tomentosa (tomentose).* *fl.* brilliant orange-red, in crowded whorls. *l.* densely covered with greyish tomentum. Nepaul. A tall branching shrub. It may be grown out of doors in warm situations, in summer. (R. H. 1873, 131.)

COLT'S FOOT. *See* **Tussilago.**

COLUBRINA (from *coluber*, a snake, in allusion to the twisted filaments of the stamens). ORD. *Rhamneæ.* Stove or greenhouse shrubs. Flowers in axillary, short, crowded cymes, or in fascicles. Leaves alternate, quite entire or crenulated, usually pubescent. The species do not possess much ornamental value, and hence are rarely seen in gardens.

COLUMBINE. *See* **Aquilegia.**

COLUMELLA. A synonym of **Pisonia** (which *see*).

COLUMELLIA (named in honour of L. Junius Moderatus Columella, a native of Cadiz, in Spain, author of one of the most valuable works on Roman agriculture; he was born about the beginning of the Christian era). SYN. *Uluxia.* The only genus of ORD. *Columelliaceæ.* It contains only two species, one of which is not yet introduced to cultivation. *C. oblonga* is a greenhouse evergreen shrub. It thrives in a mixture of loam, peat, leaf soil, and sand; and half-ripened young cuttings will strike readily in the same compost, under a hand glass, with a gentle heat.

C. oblonga (oblong). *fl.* yellow, terminal, on short peduncles; corolla rotate, with a five-lobed concave equal limb; corymbs leafy. *l.* oblong, veiny, toothed at top, attenuated at the base, shining and green above, but silky and glaucous beneath, 1in. to 2in. long. Branchlets clothed with silky down, compressed between the internodes. *h.* 20ft. Andes of Peru and Ecuador, 1875. (B. M. 6183.)

COLUMELLIACEÆ. An order of evergreen shrubs or small trees, containing but one genus—*Columellia.* Flowers with a five-lobed spreading corolla, bearing in its short tube two stamens. Leaves opposite, serrate, exstipulate.

COLUMN, or COLUMNA. The combination of stamens and styles into a solid central body; as in orchids.

COLUMNAR. Formed like a column.

COLUMNEA (named after Fabius Columna, or, more correctly, Fabio Colonna, an Italian of noble family; author of "Minus Cognitarum Stirpum Ecphrasis," Rome, 1616, and "Phytobasanos," 1 vol., 4to, Naples, 1592). ORD. *Gesneraceæ.* A genus of stove evergreens. Peduncles axillary, solitary, or crowded; corolla tubular, straightish, gibbous behind at the base, ringent; upper lip erect, arched; lower one trifid, spreading. Leaves decussately opposite, thickish, hairy or pubescent, somewhat serrated. Stems flexile, erect, or scandent. For culture, *see* **Æschynanthus.**

C. aurantiaca (orange).* *fl.* of the deepest and richest orange-colour; calyx pale yellowish-green. June. New Grenada, 1851. This beautiful but rare species makes an excellent basket plant; it grows well upon a lump of nearly rotten wood, which will absorb water like a sponge, and give it back gradually to the plant. (F. d. S. 552.)

Columnea—*continued.*

C. aureo-nitens (bright golden).* *fl.* deep rich orange-red. September. *l.* broadly-lanceolate, and densely clothed with golden-coloured silky-shaggy hairs. Columbia, 1843. A very distinct and singular species. (B. M. 4294.)

C. erythrophæa (bright red).* *fl.* solitary, axillary; corolla bright red, large; calyx large, spreading, blotched with red inside. November. *l.* lanceolate, tapering to a point, oblique at the base, rich deep green. *h.* 2ft. Mexico, 1858. Shrub. (R. H. 1867, 170.)

C. hirsuta (hairy). *fl.* usually twin; corolla purplish, or pale red, villous, hairy; calycine segments denticulated, hairy. August to November. *l.* ovate, acuminated, serrated, hairy above; petiolate. Jamaica, 1780. Climbing shrub. (B. M. 3081.)

C. Kalbreyeriana (Kalbreyer's).* *fl.* on short racemes; corolla yellow, exceeding the calyx in length, marked with red stripes in the interior; calyx yellow, 1¼in. to 2in. long. February. *l.* opposite, lanceolate, curving downwards on either side of the stem, dull green above, somewhat spotted with pale yellow; the lower surface being of a deep claret-red. One leaf of each pair is much smaller than the other, and the large and small leaves alternate. 1882. Habit shrubby, perhaps half-climbing; stems rather thick, fleshy. (B. M. 6633.)

C. rutilans (ruddy-leaved). *fl.* corolla reddish-yellow, villous; calycine segments jagged, villous. August, September. *l.* ovate-lanceolate, denticulated, rather scabrous, hairy, and coloured beneath. Jamaica, 1823. Climbing shrub.

C. scandens (climbing). *fl.* solitary; corolla scarlet, melliferous, hairy; calycine segments denticulated, pubescent. August. *l.* ovate, acute, serrated, rather villous, petiolate. Stems quadrangular. Climbing shrub. Guiana, 1759. (B. M. 1614.)

C. Schiedeana (Schiede's).* *fl.*, corolla 2in. long, clothed with glandular hairs, variegated with yellow and brown; calycine segments entire, spotted and villous. June. *l.* oblong-lanceolate, quite entire, about 5in. long, and 1½in. broad, clothed with silky hairs. Stems nodose, smoothish at bottom, but clothed with purplish hairs. Mexico, 1840. Herbaceous climber. (B. M. 4045.)

COLURIA (from *kolouros*, deprived of a tail; the seed is without the tail, so conspicuous in several allied genera). ORD. *Rosaceæ*. The only species in this genus is the hardy herbaceous perennial described below. Styles jointed, falling from the achenes when mature, not adhering as in *Geum*, to which genus it is closely related. For culture, *see* **Geum.**

C. potentilloides (Potentilla-like). *fl.* orange; stem one to three-flowered. June. *l.* interruptedly pinnate, the terminal leaflets large, the lateral ones unequal in size and shape, all canescent beneath; cauline ones trifid or entire. *h.* 6in. to 1ft. Siberia, 1780. This has at different times been placed under *Dryas*, *Geum*, and *Sieversia*.

COLUTEA (presumably from *koluo*, to amputate; the shrubs are said to die if the branches are lopped off; *Koloutea* is also used as the name of a plant by Theophrastus). Bladder Senna. ORD. *Leguminosæ*. A genus of deciduous shrubs, with small stipules, and impari-pinnate leaves, which are somewhat longer than the axillary few-flowered racemes. Coluteas are of the easiest culture in any common soil. They may be increased by seeds, which ripen in abundance; or by cuttings, inserted in sandy soil, in the autumn. They are chiefly valued as fast-growing shrubs which will thrive in almost any situation.

C. arborescens (woody).* *fl.* yellow; peduncles usually bearing about six flowers. June to August. *l.*, leaflets elliptic, retuse. *h.* 6ft. to 10ft. Middle and South of Europe (in hedges and bushy places), 1568. This is said to grow on the crater of Vesuvius, where little other vegetation exists. (B. M. 81.)

C. a. crispa (curled). A synonym of *C. a. pygmæa*.

C. a. pygmæa (dwarf)*is a dwarf-growing form, with crisped leaves. SYN. *C. a. crispa*.

C. cruenta (bloody).* *fl.* reddish-yellow, peduncles three to five-flowered. Summer. *l.*, leaflets usually seven to nine, glaucous. *h.* 4ft. to 6ft. South-east Europe and Levant, 1731.

C. haleppica (Aleppo). *fl.* yellow, larger than those of the other species here mentioned. *l.* glaucous, with small more numerous leaflets. *h.* 3ft. to 6ft. Levant, 1752.

C. media (intermediate). *fl.* orange-yellow. *l.* glaucescent. *h.* 6ft. Orient. In general aspect, this resembles *C. cruenta*, but differs in the colour of the flowers.

COLYSIS. *See* **Polypodium.**

COMACLINIUM AURANTIACUM. *See* **Dysodia grandiflora.**

COMAROPSIS (from *Komarum*, the *Comarum*, and *opsis*, resemblance). ORD. *Rosaceæ*. Of the five plants mentioned under this generic name in De Candolle's "Prodromus," three belong to *Waldsteinia* and the other two to *Rubus*.

Comaropsis—*continued.*

C. fragarioides. *See* **Waldsteinia fragarioides.**

COMAROSTAPHYLIS (from *Komaros*, the *Arbutus*, and *staphyle*, a grape; referring to the clusters of fruit). ORD. *Ericaceæ*. This genus is now included under *Arctostaphylos*. Very pretty greenhouse evergreen shrubs, bearing succulent, edible fruit. They thrive in a compost of loam and peat, and are propagated in three ways: By seeds; by cuttings, under a handlight, in the beginning of autumn; and by grafting on the *Arbutus*, in spring. In southern counties, this genus is tolerably hardy, but should at all times and in all places have a protection in winter, when grown out of doors.

C. arbutoides (Arbutus-like).* *fl.* white; racemes panicled; bracts acuminate, shorter than the pedicels. May. *l.* linear-oblong, entire, mucronate, rusty beneath. Plant erect, tomentose. *h.* 6ft. Guatemala, 1840. (B. R. 29, 30.)

C. polifolia (Polium-leaved). *fl.* crimson, racemose. May. *l.* linear-lanceolate. Plant erect, tomentose. *h.* 2ft. Mexico, 1840.

COMARUM (from *Komaros*, the *Arbutus*; in reference to its fruit being similar to that of the *Arbutus*). Marsh Cinquefoil. ORD. *Rosaceæ*. A hardy herbaceous creeping perennial, only differing from *Potentilla*, under which genus it is generally included, by the spongy character of the mature receptacle and the different colour of the flowers. It thrives in almost any kind of moist soil, and is easily increased by dividing the roots.

C. palustre (marsh). *fl.* dark purplish-brown, pedicellate, axillary, and terminal; petals lanceolate, acuminated, much shorter than the calyx. June. *l.* pinnate; leaflets broad, acutely serrated, green above, but glaucescent beneath. *h.* 1ft. to 1½ft. Northern hemisphere (Britain). The powerfully astringent rootstock yields a yellow dye. SYN. *Potentilla Comarum*. (Sy. En. B. 437.) There is a form with variegated leaves which is very ornamental.

COMBRETACEÆ. A rather extensive genus of trees or shrubs, often climbing, unarmed, very rarely spinose. Flowers in axillary or terminal spikes or racemes. Leaves alternate or opposite, or rarely whorled, entire, exstipulate. This order contains upwards of 240 species, and the genera best known are: *Combretum*, *Quisqualis*, and *Terminalia*.

COMBRETUM (a name given by Pliny to a climbing plant, the name of which is now unknown). ORD. *Combretaceæ*. Stove evergreen climbing or erect shrubs, rarely herbs. Flowers bracteate, almost sessile, rarely pedicellate; spikes solitary or twin, axillary, and terminal, opposite, or three or four in a whorl, usually disposed in a terminal panicle. Leaves entire, opposite or tern, rarely alternate. Many of the Combretums are of very considerable beauty. The most successful method of cultivation is to plant them out in a border in the stove, train them up an upright pillar, and then either up the rafters or on chains hung up in festoons lengthwise of the house. For soil, the most suitable compost is three parts peat, one loam, and one leaf mould. The only attention they require in the warm days of summer, is to give a proper supply of water at the roots, taking care to bestow a sufficient quantity to thoroughly moisten all the soil. In the early part of the season, before flowering, frequent syringings may be applied. When the flowering season is over, they ought to be considerably pruned in and thinned, and, at the same time, the branches and leaves which are to remain, should be thoroughly washed with a sponge. When this is performed, the branches may be pretty closely tied in, and they will require but very little attention until spring. Propagation may be effected by cuttings of young shoots, or, rather, stiffish side shoots, taken off with a heel, planted in sand, under a bell glass, and placed in heat.

C. Afzelii (Afzelius's). A synonym of *C. grandiflorum*.

C. elegans (elegant).* *fl.* yellow; petals lanceolate, acute, hairy; spikes simple, on short peduncles. May. *l.* elliptic; acute, acuminated, puberulous above, and clothed with yellowish tomentum beneath. Brazil, 1820.

Combretum—*continued.*

C. farinosum (mealy). *fl.* orange-coloured, sub-secund; petals scale-formed; spikes usually twin, many-flowered. April to July. *l.* elliptic-oblong, obtuse, rather coriaceous, rounded at the base, mealy beneath. Mexico, 1825.

C. grandiflorum (large-flowered).* *fl.* scarlet, large, secund; petals obovate, obtuse; spikes short, axillary, and terminal. May to July. *l.* oblong. Plant hairy. Sierra Leone, 1824. SYN. *C. Afzelii.* (B. M. 2944.)

C. laxum (loose).* *fl.* red or yellow, large, secund; petals small, elliptic, glabrous; stamens scarlet, nearly 1in. long; spikes axillary and terminal. May. *l.* ovate-lanceolate. Branches subquadrangular. Trinidad, 1818.

C. micropetalum (small-petalled). *fl.* yellow; petals obovate-lanceolate; stamens very long, bright yellow; spikes simple, densely-flowered, on short peduncles, about equal in length to the leaves. August. *l.* elliptic-oblong, acuminated, smoothish above, and lepidoted beneath. Brazil, 1867. (B. M. 5617.)

C. racemosum (racemose).* *fl.* white, on short pedicels; petals lanceolate, obtuse; panicle of many spikes; spikes elongated, tufted at the apex. February to July. *l.* ovate-oblong, acute, shining. West Coast of Africa, 1826.

COMESPERMA (from *kome*, hair, and *sperma*, a seed; in allusion to the tufts of hair at the ends of the seeds). ORD. *Polygaleæ.* A genus of about twenty-five species of greenhouse herbs, under-shrubs or shrubs, erect or twining, all natives of Australia. Flowers small, disposed in compound panicles or simple racemes. Bracts, two or three, at the base of the flowers. They thrive in a mixture of sandy loam and peat, with thorough drainage. Young cuttings will root freely, if planted in sand, under a bell glass. Comespermas, although well worth cultivating, are but rarely seen in English gardens.

C. gracilis (slender). A synonym of *C. volubilis.*

C. volubilis (twining). *fl.* very numerous; wings bright blue, with purple keels; racemes axillary, many-flowered. April. *l.* few, linear-lanceolate, bluntish, slightly wavy at the margins. Stems numerous, very slender. 1834. A very slow-growing and pretty suffruticose twiner. SYN. *C. gracilis.* (P. M. B. 5, 145.)

COMFREY. *See* **Symphytum officinale.**

COMMELINA (named after Kaspar (1667-1731) and Johann (1629-1698) Commelin, Dutch botanists). ORD. *Commelinaceæ.* This genus is allied to the better-known one of *Tradescantia*, but differs in having only three perfect stamens. Herbaceous perennials, some of which are very pretty plants, but not often seen in cultivation. The stove and greenhouse evergreen species are best grown in a light and rich soil, and are propagated chiefly by cuttings, which will root in sand, in a gentle hotbed. The tuberous-rooted species, when grown in the open, should be taken up before autumn, and stored away, like Dahlias, care being taken, however, to prevent them becoming very dry. If the position is sheltered, and the soil well drained, they may be left out. In the ensuing spring, their growth may be accelerated by the aid of slight heat, and in May, they may be transplanted out in the open. Plants thus treated, flower much stronger than seedlings.

C. africana (African). *fl.* of a tawny yellow colour, at first glance resembling those of some of the *Papilionaceæ.* May to October. *l.* lanceolate, creeping, rooting at the nodes. Stems slender, terete. *h.* 1ft. to 3ft. Cape of Good Hope, 1759. A trailing, somewhat bushy greenhouse plant. SYN. *C. lutea.* (B. M. 1431.)

C. benghalensis (Bengal). *fl.* blue, small. June. *l.* oval, green. Bengal, 1794. Stove evergreen trailer. SYN. *C. prostrata.* (R. G. 1868, 592.)

C. cœlestis (sky-blue).* *fl.* blue; peduncles pubescent; spathes cordate acuminate, folded together. June. *l.* oblong-lanceolate; sheath ciliated. *h.* 1½ft. 1813. Half-hardy herbaceous perennial. See Fig. 504. (S. B. F. G. 3.)

C. c. alba (white)* resembles the type, except in the colour of the flowers.

C. deficiens variegata (deficient variegated). *fl.* blue, small, produced at the ends of the branches. *l.* ovate-lanceolate, freely and elegantly striped with longitudinal bands of white. Stems terete, branching. Brazil. A low-growing, diffuse, stove perennial. (The type is figured in B. M. 2644.)

C. elliptica (elliptic).* *fl.*, calyx white, glabrous; peduncles 2in. long, straight, with a line of reflexed hairs along the inner sides. July. *l.* lanceolate, acuminate, flat, glabrous on both sides, shining bright green above, whitish below, seven-nerved, the middle rib prominent behind, channelled above. Stem ascending, rooting, branched, red, especially above the joints, hairy. *h.* 1½ft. to 2ft. Lima. A very pretty greenhouse species. (B. M 3047, under the name of *C. gracilis.*)

Commelina—*continued.*

FIG. 504. COMMELINA CŒLESTIS, showing Habit, and detached Flower (natural size).

C. erecta (erect). *fl.*, spathes crowded and nearly sessile, hooded, top-shaped in fruit. Summer. *l.* large, 3in. to 7in. long, 1in. to 2in. wide, oblong-lanceolate, the upper surface and margins rough backwards. Stems erect, rather stout. *h.* 2ft. to 4ft. Pennsylvania. One of the largest species. Hardy. There is a hairy form, *C. hirtella.*

C. lutea (yellow). A synonym of *C. africana.*

C. prostrata (prostrate). A synonym of *C. benghalensis.*

C. scabra (rough). *fl.* purplish-brown, terminal, eight or ten together, each blossom 1in. across. July. *h.* 1ft. Mexico, 1852.

C. virginica (Virginian).* *fl.* blue; spathes mostly solitary or scattered, peduncled, conduplicate, round-heart-shaped when expanded, pointed, in fruit somewhat hood-like. Summer. *l.* oblong or linear-lanceolate. Stems slender, erect, or reclined and rooting towards the base. South United States. Hardy. There is a narrow-leaved form, named *C. angustifolia.*

COMMELINACEÆ. An extensive, widely dispersed order of herbaceous plants, principally confined to the warmer regions. Outer perianth of three segments, and the inner also of three, and coloured. Leaves flat, usually sheathing at the base. There are above 300 species. The two best-known genera are *Commelina* and *Tradescantia.*

COMMERSONIA DASYPHYLLA. A synonym of **Rulingia pannosa** (which *see*).

COMOCLADIA (from *kome*, hair, and *klados*, a branch; in allusion to the leaves being crowded at the tops of the branches). Maiden Plum. ORD. *Anacardiaceæ.* Stove evergreen trees, abounding in clammy juice. Flowers purple, small, on short pedicels, disposed in loose branched panicles; petals three to four, imbricate. Leaves impari-pinnate, with opposite leaflets. They succeed well in a mixture of peat or loam, or any light rich soil. Ripened cuttings root in sand, if placed under a glass, in heat.

C. dentata (toothed). *l.*, leaflets on short footstalks, oblong, erosely-toothed, smooth above and downy beneath. *h.* 30ft. Cuba, 1790.

C. ilicifolia (Holly-leaved). *l.*, leaflets ovate or roundish, sessile, smooth, with spiny angles; spines one to three on each side. *h.* 20ft. 1778.

C. integrifolia (entire-leaved). *l.* about 2ft. long; leaflets stalked, lanceolate, quite entire, smooth. *h.* 10ft. to 30ft. Jamaica, 1778.

COMPARETTIA (named after Andreas Comparetti, professor at Padua, and a writer on vegetable physiology; born in 1746, died in 1801). ORD. *Orchideæ.* Elegant but very rare stove epiphytal Orchids, with handsome, generally drooping, racemes of small but brightly-coloured flowers, which retain their beauty for a considerable period. They succeed well on small blocks of wood, with live sphagnum, suspended from the roof of a moderately warm

Comparettia—*continued.*

house, where they will not be fully exposed to the sun. Comparettias require a liberal supply of moisture during the growing season, and at no time should they be allowed to become dry. Propagated by division of the plants.

C. coccinea (scarlet).* *fl.*, sepals and petals brilliant scarlet; lip the same colour, with a tinge of white at the base; racemes three to seven-flowered. November. *l.* bright green on the upper surface, elegant purple beneath. Brazil, 1838. (B. R. 24, 68.)

C. falcata (sickle-shaped).* *fl.*, sepals and petals rich rosy-purple; lip the same colour, but thickly veined with a deeper shade. Columbia, 1836. Not very dissimilar to *C. coccinea*, but having broader leaves and somewhat differently shaped flowers. Very rare.

C. macroplectron (long-spurred).* *fl.* pale rose-coloured, speckled with red, distichous, nearly 2in. long from the tip of the dorsal sepal to the end of the lip; racemes pendulous. *l.* two to three, 4in. to 5in. long by ¼in. to 1¼in. broad, leathery, green above; pale, and faintly streaked with rusty-yellow, beneath. New Grenada. (B. M. 6679.)

C. rosea (rosy).* Very small, but pretty, with shorter and more compact racemes than *C. falcata*. Spanish Main, 1843. Rarely seen. (P. M. B. 10, 1.)

COMPLICATE, COMPLICATED. Folded up upon itself.

COMPOSITÆ, or ASTERACEÆ. The most extensive order of herbs and shrubs, or trees, in the vegetable kingdom. There are between 700 and 800 genera, and about 10,000 species. Flowers collected into a head on a common receptacle, and surrounded by an involucre. Leaves alternate or opposite, exstipulate. Among the more important genera are: *Aster*, *Chrysanthemum*, and *Dahlia*.

COMPOSTS. A term applied to any mixture of different soils or manures, either for potting purposes, or for top-dressing plants in pots or in the open ground. It may consist of different ingredients, with or without the addition of any manure, according to the habit or requirement of the subject for which it is intended. Manures that would prove destructive by their strength to any plant in a pot, may be mixed to form a certain proportion of the Compost, and thereby prove beneficial. Loam, in most cases, forms the greater bulk of soils used for fruit-trees, and for most strong-growing plants of the soft-wooded class. This is not often suitable for use wholly by itself, consequently the addition of other material has to be made, to render it lighter, and so encourage root action, or to keep it sufficiently porous to allow the free passage of air and water. Charcoal, sharp sand, leaf soil, burnt earth, peat, and many other things, besides so-called manures, may be used for this purpose; and, although it may be necessary to add something stronger for sustaining any given plant, yet one or more of these may be generally used beneficially. A Compost of any description should be thoroughly mixed before being used, in order that the different parts may be evenly incorporated. It should be in a condition not too dry nor sufficiently wet to cling together. This is very important, as the after condition of the plants will, in many cases, testify. All manures should be used when somewhat dry, and none applied when in a fresh state, as then they often prove destructive. Good leaf soil is one of the most useful ingredients for Composts, and that which has never been placed in sufficient bulk to cause violent heating, is the best. If obtained from woods where decay has taken place very gradually, it is much to be preferred. It should then be collected ready for use as required, and it will not, as a rule, generate sufficient heat afterwards to cause injury. Hard-wooded greenhouse plants succeed in peat and sand, and manure should never be applied to them. It must be remembered, in preparing a Compost for such subjects, that it will probably have to last for a period of at least twelve months. The following questions should be considered when preparing a mixture of soil. What is the description of plant for which it is intended? Is it a hard or soft-wooded subject? and Is it to be potted

Composts—*continued.*

temporarily or permanently? Young plants are, in all cases, benefited by having a lighter soil than others better established, as root action is thereby encouraged. These principles should always be considered, and all subjects treated accordingly. Suitable Composts for most plants are given under their respective headings; consequently, it is only necessary here to give instructions for general guidance. Study and personal experience with the various requirements of the plants to be potted, must be exercised in the application of suitable ingredients in the Compost. *See also* **Manures.**

COMPOST YARD. An inclosure in gardens, generally in the neighbourhood of the potting sheds, where different soils, manures, &c., are stored until required for use. A great advantage is gained if the Compost Yard contains an open shed, in which the whole or a part of the soils used for potting, can be placed, and kept dry, or be prepared in wet weather for use. A rule should always be enforced of having that portion of any soil or manure left properly placed together and tidy each time any is taken away.

COMPOUND. When formed of several parts united in one common whole. A Compound Leaf is shown at Fig. 505.

FIG. 505. COMPOUND LEAF.

COMPOUND CORYMB. A branched Corymb, the divisions of which are corymbose.

COMPRESSED. Pressed together and flattened.

COMPSANTHUS. A synonym of **Tricyrtis** (which *see*).

COMPSOA. A synonym of **Tricyrtis** (which *see*).

COMPTONIA (named after Henry Compton, once Bishop of London, the introducer and cultivator of many curious exotic plants, and a great patron of botany). ORD. *Myricaceæ*. An ornamental hardy deciduous shrub, requiring peat earth and a shady situation. Propagated by layers, which should be put down in autumn.

C. asplenifolia (Spleenwort-leaved).* *fl.* whitish; male catkins lateral, cylindrical; female catkins lateral, ovate. March and April. *l.* simple, alternate, lanceolate, pinnatifidly toothed, downy, sprinkled with yellowish, resinous, transparent particles. Stipules half heart-shaped. *h.* 3ft. to 4ft. North America, 1714. A distinct shrub, with fragrant fern-like leaves. (W. D. B. 166.)

CONANDRON (from *konos*, a cone, and *aner*, *andron*, a male, an anther; the appendages to the anthers are united in a cone around the style). ORD. *Gesneraceæ*. A rare and very pretty, but not quite hardy, herbaceous perennial. For cultivation, *see* **Ramondia**, to which this genus is allied.

C. ramondioides (Ramondia-like).* *fl.* shortly pedicellate, with linear bracts, borne on leafless scapes in a forked corymbose cyme, which is at first drooping; corolla white, or pink with a purplish eye, rotate, twice the length of the calyx; tube sub-globose, whitish; calyx about ¼in. long, pubescent. Summer. *l.* few, sometimes solitary, stalked, ovate-oblong, acute, coarsely serrated, dark green and rugose. *h.* 6in. Japan, 1879. (B. M. 6484.)

CONANTHERA (from *konos*, a cone, and *anthera*, an anther; in reference to the six anthers forming a cone in the early stage of the flower). ORD. *Liliaceæ*. Very pretty little half-hardy bulbous plants, rather difficult to preserve, and hence rarely seen in English gardens. They should be planted in sandy soil, in a warm border, and be well protected throughout the winter from excessive rains and frosts; or lifted and stored in sand, in frost-proof quarters. Propagated by offsets, or by seed.

C. bifolia (two-leaved). *fl.* blue, in small panicles. April. *l.* linear, acute. *h.* 6in. to 1½ft. Chili, 1823.

C. campanulata (bell-shaped). *fl.* blue, paniculate. April. *l.* linear, shorter than the peduncle. *h.* 1ft. Chili, 1823. SYN. *Cumingia campanulata*. (B. M. 2486, under the name of *Conanthera bifolia*.)

CONCAVE. Hollow.

CONCENTRIC. Having a common centre.

CONCRETE. A cement composed of pebbles, lime and sand. It is largely employed for walks and for the foundations of buildings. *See also* **Walks.**

CONCRETE. Formed into one mass, or joined together.

CONDOR VINE. *See* **Gonolobus Cundurango.**

CONDUPLICATE. In vernation, folded face to face.

CONE. The strobilus or scaly fruit of a Pine or Fir tree.

CONE FLOWER. *See* **Rudbeckia.**

CONE HEAD. *See* **Strobilanthes.**

CONFLUENT. Gradually united.

CONIFERÆ. A large order of trees or shrubs, mostly evergreen, and with resinous secretions. Flowers monœcious or dicœcious, naked, disposed either in cylindrical or short catkins, with closely-packed scales. The females are sometimes solitary. Ovules and seeds naked. Leaves alternate, opposite, or fascicled in a membranous sheath, often narrow, needle-like, or rigid, or reduced to dense imbricating scales, rarely with a flattened limb. Bentham and Hooker divide this large family into six tribes, viz.: ABIETINEÆ, containing *Abies, Cedrus, Larix, Picea, Pinus, Pseudotsuga,* and *Tsuga*; ARAUCARIÆ, containing *Agathis, Araucaria,* and *Cunninghamia*; CUPRESSINEÆ, containing *Actinostrobus, Callitris, Cupressus, Fitzroya, Juniperus, Libocedrus,* and *Thuja*; PODOCARPEÆ, containing *Microcachrys, Podocarpus,* and *Saxegothea*; TAXEÆ, containing *Dacrydium, Ginkgo, Pherosphæra, Phyllocladus, Taxus,* and *Torreya*; TAXODIEÆ, containing *Athrotaxus, Cephalotaxus Cryptomeria, Sequoia,* and *Taxodium.*

CONIUM (from *konao*, to whirl around; in reference to the giddiness caused by eating the leaves). Hemlock. ORD. *Umbelliferæ.* Biennial poisonous herbs. Involucre of three to five leaves; involucels dimidiate. Leaves decompound. Stem terete, branched. Root fusiform. Not more than two or three species are known, of which one (*C. chærophylloides*) is South African and Abyssinian. The Common Hemlock (*C. maculatum*) is widely spread over Europe, North Asia, and Siberia. It has long been used in medicine.

CONJUGATE. When a leafstalk bears but a single pair of leaflets.

CONNARACEÆ. An order of trees or shrubs, closely allied to *Leguminosæ*, but having perfectly regular flowers. Flowers small, in axillary or terminal racemes or panicles. Leaves alternate, usually pinnate, stipulate. The best-known genus is *Connarus.*

CONNARUS (from *Konnaros*, the name of an unknown tree, described at length by Athenæus). SYN. *Omphalobium.* ORD. *Connaraceæ.* A large genus of ornamental stove evergreen shrubs. Most of them are natives of tropical Asia and America. Flowers white, disposed in racemose panicles. Leaves alternate, leathery, impari-pinnate. A mixture of loam and peat will answer well for these plants. Cuttings of firm shoots, taken in April, will root, if planted in sand and placed in bottom heat, under a bell glass.

C. pubescens (downy). *fl.* white, sweet-scented, disposed in axillary and terminal panicles. *l.*, leaflets five, oval, acute, smooth above, covered beneath with rather white pubescence. *h.* 5ft. French Guiana, 1822. SYN. *Robergia frutescens.*

Other species known to cultivation are: *nitidus* and *paniculatus.*

FIG. 506. CONNATE LEAF.

CONNATE. Where the bases of opposite leaves are joined together. See Fig. 506.

CONNIVENT. Converging; having a gradually inward direction.

CONOCARPUS (from *konos*, a cone, and *karpos*, a fruit; in reference to the scale-formed fruit being so closely imbricated in a head as to resemble a small Fir-cone). Button-tree. ORD. *Combretaceæ.* The only species is a stove evergreen shrub. Heads of flowers pedunculate; flowers crowded; petals absent. Leaves alternate, quite entire. This plant thrives in a mixture of loam and peat. Cuttings of firm shoots, taken in April, will root in sand, if placed under a bell glass, in bottom heat.

C. erectus (upright).* *fl.* white, in panicled heads. *l.* oblong-lanceolate, tapering to both ends, thickish, glabrous, or, when young, rather downy, biglandular at the base. *h.* 6ft. to 8ft. Tropical America, 1752.

CONOSPERMUM (from *konos*, a cone, and *sperma*, a seed; the fruit or carpels growing close together, and forming a cone). ORD. *Proteaceæ.* Greenhouse evergreen shrubs, from extra-tropical (mostly Western) Australia, principally white-flowered. This genus does not appear to be much known in horticultural circles. Of more than thirty species known to science, eight or nine are reputed to have been introduced.

CONOSTEGIA (from *konos*, a cone, and *stege*, a covering; in reference to the conical calyptriform calyx falling off in one piece). ORD. *Melastomaceæ.* Stove evergreen trees or small shrubs. Flowers in terminal panicles. Leaves petiolate, entire or denticulate, three to five-nerved. For culture, *see* **Melastoma.**

C. Balbisiana (Balbis's). This species is a twining shrub, of which the leaves are oval and blunt, with a point.

C. procera (tall). *fl.* rosy or white, large, on simply-divided panicles. June. *l.* elliptical-oblong, sub-triplinerved. *h.* 25ft. Jamaica, 1825.

CONOSTEPHIUM (from *konos*, a cone, and *stephos*, a crown; referring to the disposition of the flowers). ORD. *Epacrideæ.* An ornamental greenhouse evergreen shrub. Flowers solitary, recurved, axillary. Fruit a hard indehiscent drupe, one-celled by abortion of the other four cells. Leaves scattered. It thrives in a compost of peat and sandy loam. Cuttings of young shoots, taken in April, will root in sand.

C. pendulum (hanging down). *fl.* red. April. *h.* 6in. to 18in. West Australia.

CONRADIA. *See* **Pentarhaphia.**

CONSERVATORY. This structure is distinguished from a greenhouse by having central beds, in which permanent plants are placed, in addition to those arranged to form a continued floral display on the side shelves. The term is also applied to small glass structures where a few creepers are planted for covering the roof or back wall, and the remaining space occupied by decorative foliage or flowering plants. The greatest enjoyment is obtained from a Conservatory either joined to the mansion or connected with it by means of a suitable corridor. An opportunity is then afforded of visiting and admiring the flowers in any weather or at any season. This arrangement is not always practicable with large glass houses, on account of the position of the mansion, or its style of architecture; consequently, the plan of having an isolated building has to be adopted. The latter is, as a rule, better suited to good cultivation, and gives greater facilities to the gardener for renewing and arranging the movable plants. In the other case, only a very limited time can be allowed each morning for such work. Conservatories found in gardens of an early period, have, in many cases, been built to correspond, and produce with the mansion an architectural effect. This much they may do, but they are wholly unsuited to good plant culture. If the external architecture of a Conservatory has to coincide with that of another building, the important and primary point of making suitable provision for the well-being of the plants

Conservatory—*continued.*

internally, should also be in some way combined. Those of modern construction are invariably better in this respect than many of an earlier date. Only sufficient space is here available to give a few general remarks, that may be modified to suit individual requirements. The selection of position has at times no alternative, but if there is an opportunity, an open one with a south or south-west aspect should be chosen, so as to obtain all possible sunshine in winter. Shelter afforded by trees from north and east winds is also a great advantage at that season, but they should be sufficiently far away as not to overhang the house. Provision for admitting abundance of light and air, both at top and bottom, is of great importance. The ventilators at the apex only are best for winter use, but all may be utilised in summer, as cool-house flowering plants are soon injured in a close atmosphere or a high temperature. A thin shading is necessary in bright weather, but is best if placed on rollers, to admit of removal at other times. The heating apparatus should be capable of maintaining a temperature of 50deg. in winter, although it is not always advisable to keep so high as this. The pipes are best concealed as much as possible under the side stages, or a part may be under the floor, covered with perforated iron gratings, through which the heat will pass readily. In the formation of the ground plan, sufficient width should always be allowed for the paths. These may be made of gravel, and covered with white spar or shell, or a lasting floor may be formed of ornamental tiles that are specially made for the purpose. A kerbing of terra-cotta or stone should separate the paths from the beds of soil. Sufficient space cannot be obtained for placing many plants out of pots in small glass houses that adjoin or form part of a mansion. In large structures, of proportionate hight, a much greater diversity of plants, both in size and habit, may be introduced permanently. Beds for these must have ample drainage and a depth of nearly 3ft. of good soil, formed principally of loam and peat, with plenty of charcoal intermixed, to keep it open and allow water to pass freely. A cool fernery for the smaller growing varieties, placed in connection with, or forming part of, a Conservatory, is always a great source of attraction, especially if some rockwork is constructed on which to plant the ferns. This part should be on the northern side, or in the coolest position obtainable. Many such places are among the best for cultivating cool orchids, as the requisite moisture given the ferns is just what is required by the former when placed on inverted pots or suspended from the roof. Hanging baskets, if well filled and attended to, by watering frequently in summer, are always good additions to Conservatory decoration. Where there is sufficient space, large cool or temperate tree ferns, with others of a dwarfer type, also cycads and palms, may be introduced, with Araucarias, Aralias, Camellias, Dracænas of the green-leaved type, greenhouse Rhododendrons, and many other plants of a similar habit, to form permanent features. Care must be taken, and forethought exercised, regarding their arrangement and the position to be occupied by each when fully developed. Climbers and pillar plants must not be omitted in any Conservatory, as many of these show to much greater advantage when grown in this way, although they may be amenable to other systems of culture. A few indispensable ones may be given: *Begonia fuchsioides*, *Bougainvillea glabra*, Cestrums, Fuchsias, Lapagerias, cool-house species of *Passiflora*, *Plumbago capensis*, climbing Tea or Noisette Roses, *Tacsonia exoniensis* and *T. Van Volxemii*, &c. Temporary plants, suitable for the embellishment of the stages and Conservatory generally, are endless in variety, and will be found recommended for the purpose under their respective headings. A band of *Selaginella Kraussiana*, about 9in. wide, planted on the margin of the beds, and, if practicable, on the side shelves also, tends greatly to increase

Conservatory—*continued.*

the general effect produced by the plants. All Conservatories, and everything connected therewith, should at all times be kept as clean and tidy as possible.

CONSTRICTED. Tightened or contracted in some particular place.

CONTIGUOUS. So close as to touch one another.

CONVALLARIA (from *convallis*, a valley, and *rica*, a mantle; in reference to the dense covering formed by the leaves, and to its natural habitat). Lily of the Valley. ORD. *Liliaceæ*. A monotypic genus, consisting of the universally admired Lily of the Valley. It is a widely-distributed, hardy, herbaceous perennial, being found throughout Europe (Britain), North Asia, and also in the United States. For the various methods of culture, and enumeration of varieties, *see* **Lily of the Valley.**

FIG. 507. CONVALLARIA MAJALIS, showing Habit and detached Raceme.

C. majalis (May). *fl.* pure white, bell-shaped; raceme gracefully arching. Spring. *l.* twin, radical, on long stalks, elliptic oblong, marked with a delicate tracery of nerves and veins. *h.* 6in. to 1ft. See Fig. 507.

CONVOLUTE. Rolled together, or over each other. A form of vernation.

CONVOLVULACEÆ. An extensive order of herbs or shrubs, usually twining, and with a milky juice. Flowers regular, solitary or crowded on the peduncles; corolla plaited. Leaves alternate, exstipulate. This order is said to contain nearly 700 species; it includes such well-known genera as *Batatas*, *Calystegia*, *Convolvulus*, *Ipomœa*, and *Pharbitis*.

CONVOLVULUS (from *convolvo*, to entwine; referring to the twining habit of most of the species). Bindweed. ORD. *Convolvulaceæ*. A genus comprising about 150 species of annual or perennial, prostrate, twining or erect herbs or sub-shrubs, distributed throughout all temperate and sub-tropical parts of the world; the Mediterranean region, however, is the head-quarters of the genus. Corolla funnel-shaped or campanulate. Leaves alternate, entire, dentate, or lobed, lanceolate, often cordate or sagittate. They are, for the most part, very handsome plants, when in full blossom. All are of very simple culture. The tender species do best in a compost of peat, leaf soil, and loam, and are usually propagated by cuttings—sometimes by seeds—in spring. The hardy annuals should be sown in spring, in the open border. The hardy perennials may be increased by young cuttings; by division of the roots; or by seeds, sown in spring.

C. althæoides (Althæa-like).* *fl.*, corolla pale red or lilac, large, spreading, entire; peduncles usually one-flowered; sepals ovate, acute. June. *l.* shining, silvery; lower ones cordate, deeply crenated; superior ones pedatifid; middle one long, pinnatifid. South Europe, 1597. Hardy deciduous perennial. (S. F. G. 194.)

C. arvensis (field). Small Bindweed. *fl.* white or pink, 1in. in diameter; peduncles axillary, usually two-flowered, with two small bracts at their fork, and a third on one of the pedicels, at some distance from the flower; sepals small, broad. June to September. *l.* 1in. to 3in. long, very variable, apiculate; lobes acute. Stems numerous, trailing or twining, slender. Europe, and Central and Russian Asia, except the extreme north; common, and often a troublesome weed, in England and Ireland, and local in Scotland. A charming little plant for hanging baskets. See Fig. 508.

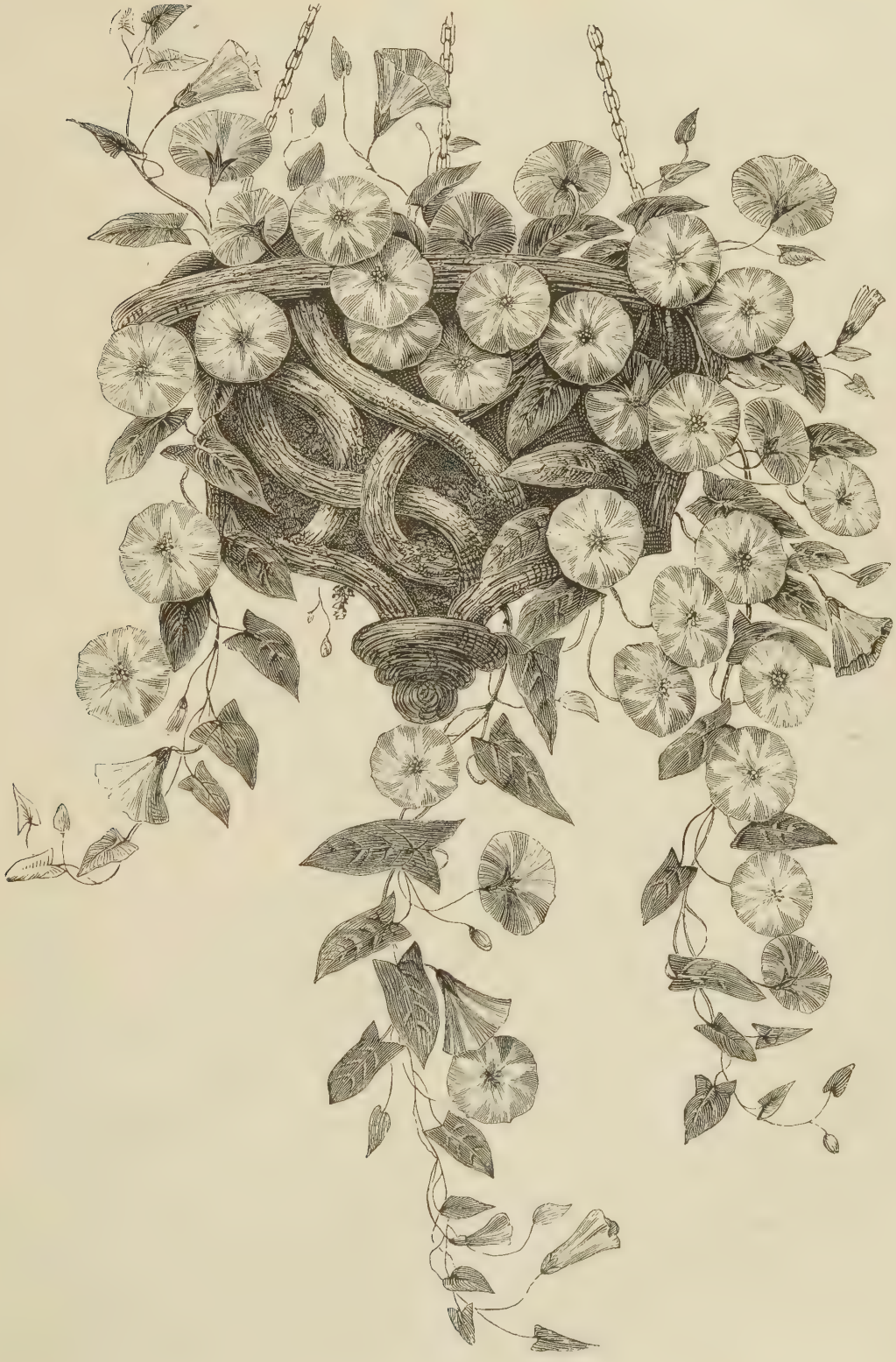


FIG. 508. CONVOLVULUS ARVENSIS.

Convolvulus—*continued.*

C. bonariensis (Buenos Ayres). *fl.*, corolla white, variegated with red veins, small; peduncles generally three-flowered, shorter than the leaves. July. *l.* hastate, cuneated at the base, each terminating in a bristle, petiolate; middle lobe linear, 2in. long, obtuse, two lines broad; lateral ones very short. Chili, 1817. Hardy deciduous.

C. bryoniæfolius (Bryony-leaved). A synonym of *C. italicus.*

C. canariensis (Canary Islands). *fl.*, corolla purplish-violet, hairy outside, at length almost flat; peduncles many-flowered, longer than the petioles; calyx villous. June to September. *l.* cordate, oblong, acute, downy. Stem terete, villous. Canary Islands, 1690. Half-hardy evergreen. (B. M. 1228.)

C. cantabricus (Cantabrian).* *fl.*, corolla pale red; peduncles usually two to three-flowered; sepals narrow, very villous. August. *l.* oblong-lanceolate, acute. Plant beset with spreading hairs. Stem branched, prostrate. *h.* 6in. to 1ft. South Europe, 1680. Hardy deciduous.

C. chinensis (Chinese).* *fl.* at the upper part of the stem, axillary, solitary, pointing one way; corolla rotately funnel-shaped; peduncles spreading; calyx greenish, much shorter than the corolla; limb large, purplish-crimson, marked in the disk with an unequally-pointed pale yellow star, surrounded by a purple halo. *l.* firm, sub-coriaceous, greyish-green, hastate; middle lobe elongated, oblong, somewhat tapered, blunt, with a small point; side ones divaricate, short, quite entire; petioles linear, channelled. *h.* 2ft. to 3ft. Root creeping. China. Hardy perennial. The flower expands during the night, or early in the morning, and fades in the forenoon. (B. R. 322.)

C. Cneorum (Cneorum).* *fl.* capitate, on short peduncles; corolla light pink, hairy outside; some of the bracts as large as the leaves, hairy. May. *l.* lanceolate, clothed with silvery-silky tomentum. Stem branched. *h.* 1ft. to 3ft. South Europe, 1640. Half-hardy shrub. (B. M. 459.)

C. elongatus (trailing). *fl.* white, small; corolla sub-rotate, rather deeply five-lobed; peduncles axillary, solitary, filiform, tomentosely villous, one to two-flowered; calyx funnel-shaped, green; lobes rounded, slightly furred on the outside. July, August. *l.* alternate, wide asunder, cordate, taper-pointed, thin, lively green, about 1½in. in length and 1in. across, beset with white atomous dots, and bare on the upper side, slightly furred on the under; petioles round, many times shorter than the leaf. Canary Islands, 1815. Hardy annual. (B. R. 498.)

C. erubescens (erubescent).* *fl.* reddish-pink, small; peduncles one to three-flowered, shorter than the leaves; sepals equal, ovate, mucronulate, spreading. July to September. *l.* hastate; hind lobes toothed or cut; intermediate one lanceolate or linear, toothed or quite entire. Plant rather pilose. Australia, 1803. Greenhouse biennial. (B. M. 1067.)

C. Herrmanniæ (Herrmann's). *fl.*, corolla white, small; limb crenulated, acute; sepals ovate, acuminated, downy, nearly equal; peduncles two-flowered, longer than the petioles. August. *l.* oblong-lanceolate, cordately sagittate at the base, obtuse, mucronate, crenately repand. Plant tomentose, white. *h.* 5ft. Peru, 1799. Greenhouse evergreen.

C. italicus (Italian). *fl.*, corolla reddish-purple, large; peduncles long, one-flowered, articulated; sepals ovate, acute. July. *l.*, lower ones cordate, obtuse, crenated or toothed; upper ones somewhat palmately seven-lobed; middle ones long, toothed, or lobed. Plant rather hispid, green. China, 1802. Half-hardy evergreen. SYN. *C. bryoniæfolius.* (B. R. 1847, xii.)

C. lanuginosus (woolly). *fl.*, corolla yellowish, with a lanceolate purple ray on the outside of each lobe, clothed with yellowish hairs; peduncles three-flowered, pilose; the three outer sepals very hairy, ovate, acuminated. July. *l.* shortly petiolate, cordate-oblong, somewhat hastate, clothed with very soft, rusty, silky tomentum. Levant, 1816. Hardy deciduous.

C. lineatus (lined).* *fl.*, corolla pale reddish-purple, hairy outside; sepals rather foliaceous, silky; peduncles one to two-flowered, shorter than the leaves. June. *l.* lanceolate, petiolate, acute, silky, villous, lined. Floriferous stems erect, simple, corymbose at top. *h.* 6in. South Europe, 1770. Hardy deciduous.

C. major. The very common annual known by this name is **Ipomœa purpurea** (which *see*).

C. mauritanicus (Mauritanian).* *fl.* blue, with a white throat and yellow anthers, small, about 1in. across; calyx villous, with five linear divisions, two of which are rather smaller than the others; peduncles one, two, or three-flowered. Summer. *l.* nearly ovate, alternate, in two rows, on very short petioles. North Africa. Plant covered with minute soft white hairs. Greenhouse (or quite hardy in many places) prostrate twining perennial, very useful for baskets. (F. d. S. 2185.)

C. ocellatus (eyed).* *fl.*, corolla white, with a deep red-purple eye; scarcely 1in. in diameter, with a short tube, a little longer than the calyx, which gradually expands into a spreading five-angled limb; peduncles rising from the axils of the

Convolvulus—*continued.*

leaves; calyx of five ovate, acuminated sepals, of which the three outer are more or less silky on the back; stamens five, within the tubular part of the corolla. August. *l.* sessile, linear, rather acute, entire, one-nerved, clothed on both sides, but especially beneath, with appressed, silky, white hairs. South Africa. A very neat, Evolvulus-like species. (B. M. 4065.)

C. pannifolius (cloth-leaved).* *fl.*, corolla of a pale violet-purple, white in the disk and tube, marked with five deeper stellate folds, which are roughly pubescent on their under side; peduncles solitary, axillary, longer than the leaf, filiform, and rather hard, divided upwards into cymes of three to twenty flowers; calyx several times shorter than the corolla, pubescent; tube shorter than the calyx. *l.* oblong-cordate, reticulately veined and wrinkled underneath, with many pale varicose nerves; petioles shaggy. The native habitat of this species is doubtful, but, in all probability, it is from the Canary Islands. A twining greenhouse shrub, well adapted for conservatory decoration. (B. R. 222.)

C. pentapetaloides (five-petaled-like). *fl.*, corolla bluish, small, with a yellow throat, and a semi five-cleft limb; peduncles short, one-flowered. June. *l.*, lower ones petiolate, spathulate-lanceolate, obtuse, nearly naked, lined, ciliated; upper ones linear-cuneiform, sessile. Plant prostrate, creeping, filiform. Stem rather hairy at top. *h.* 6in. South Europe, 1789. Hardy annual. (S. F. G. 197.)

C. persicus (Persian). *fl.*, corolla white; sepals ovate, inner ones smaller; peduncles one-flowered, length of leaves. June. *l.* oval, obtuse, on very short petioles. *h.* 1ft. Persia, 1829. Hardy deciduous.

C. Scammonia.* Scammony. *fl.*, corolla cream-coloured, or very pale red, large, campanulate; sepals loose, glabrous, ovate, repand, obtuse, point reflexed; peduncles generally three-flowered, longer than the leaves. July. *l.* cordate-sagittate, truncate behind. Stem angular. Levant, 1726. Plant glabrous. Hardy deciduous. A gum-resin is obtained from the roots of this species which is largely used in medicine as a purgative.

C. scoparius (Broom-like). *fl.*, corolla white, hairy outside; peduncles generally three-flowered; calyx silky; sepals ovate, acute. August and September. *l.* linear and rather pilose. Stem terete, glabrous. Teneriffe, 1733. Shrub. The wood of this species is hard and white, with radiating stripes. (B. R. 1841, 43.)

C. suffruticosus (sub-shrubby). *fl.*, inflorescence on three-flowered peduncles, sometimes sub-divided, and with more flowers, shorter than the leaf; corolla white, with a yellow disk and five purple lines answering to the same number of broader villous ones on the outside, flatly expanded down to the short tube within the calyx; calyx three times shorter than the flower, spreading above the middle, where the leaflets are broad and ciliate. June and July. *l.* deep green, elongatedly cordate, tapered to a point, slightly pubescent on both sides, on the upper appressedly so; petioles scarcely one-third as long. *h.* 3ft. to 4ft. Madeira, 1788. A slender twining shrub. (B. R. 133, plate numbered 132.)

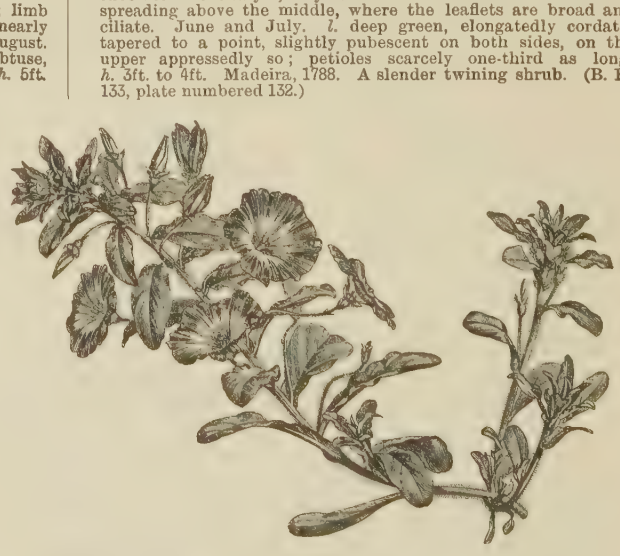


FIG. 509. FLOWERING STEM OF CONVOLVULUS TRICOLOR.

C. tricolor (three-coloured).* The Dwarf Convolvulus of gardens. *fl.*, corolla rather large, with a yellowish throat, a blue limb, the rest white; sepals ovate-lanceolate, acute; peduncles one-flowered, bibracteate, longer than the leaves. July to September. *l.* ovate-lanceolate, or spathulate, hairy, ciliated. Stem declinate, terete, beset with small, soft, white hairs. *h.* 1ft. Sicily, Spain, and Portugal, 1629. See Fig. 509. (B. M. 27.) Of this very popular hardy annual there are several varieties, differing principally in the colour of the flowers.

CONYZA (from *konis*, dust; because it was supposed to have the power, when powdered and sprinkled, of driving away flies). Fleabane. ORD. *Compositæ*. A rather extensive genus of stove, greenhouse, and hardy herbaceous plants, rarely shrubby. The involucre is campanulate, with from two to several series of linear or linear-lanceolate bracts; receptacle flat or convex, naked or foveolate; disk-florets yellow, those of the ray paler in colour. Leaves alternate, entire, toothed (rarely cut). There are about fifty species, most of which are confined to tropical and sub-tropical regions of both hemispheres. They are mainly of botanical interest only, and do not call for further mention in this work.

COOKIA (named after Captain James Cook, R.N., the celebrated circumnavigator, who was killed in the Sandwich Islands in 1779). Wampee-tree. ORD. *Rutaceæ*. Small greenhouse trees. Leaves impari-pinnate; leaflets alternate, unequal at the base, or oblique. They thrive well in a mixture of loam and sandy peat. Ripened cuttings, not deprived of any of their leaves, will root in sandy soil, if plunged under a hand glass, in a moist heat. This genus is now merged into *Clausena*, and the proper name of the species below mentioned is *Clausena Wampi*.

C. punctata (spotted). *fl.* white, small, disposed in racemose panicles. *fr.* edible, about the size of a pigeon's egg, yellow on the outside; pulp white, rather acrid, but sweet. June and July. *l.*, leaflets ovate-lanceolate, acuminated, hardly unequal at the base. *h.* 20ft. Probably a native of China, 1795. A middle-sized tree, now cultivated (and partly naturalised) in many tropical countries.

COOPERIA (named after Mr. Joseph Cooper, a very successful cultivator, and at one time gardener at Wentworth House, in Yorkshire, the residence of Earl Fitzwilliam). ORD. *Amaryllideæ*. Closely allied to *Zephyranthes*. There are two species of this genus in cultivation, with solitary Primrose-scented flowers, which are remarkable in the order, on account of their expanding during the night. They are hardy only in sheltered situations. For culture, propagation, &c., *see* **Zephyranthes.**

C. Drummondi (Drummond's). *fl.* white, the tube changing to red; tube 4in. to 5in. long; limb 1¼in. to 2in. across, with ovate segments. August. *l.* linear, twisted, 10in. to 15in. long. *h.* 6in. to 9in. Texas. (B. R. 1835.)

C. pedunculata (peduncled). *fl.* white, the peduncle more developed, and the tube shorter, than in *C. Drummondi*. August. *l.* linear-oblong, obtuse, glaucescent. Texas. (B. M. 3727.)

COPAIBA BALSAM. *See* **Copaifera officinalis.**

COPAIFERA (from *Copaiba*, the Brazilian name for the balsam of Capevi, and *fero*, to bear; trees producing the balsam of Capevi). ORD. *Leguminosæ*. Stove evergreen trees. Flowers generally white, disposed in panicles. Leaves impari-pinnate; leaflets coriaceous. They thrive in a sandy loam. Cuttings of firm shoots will root in sand, in March, if placed in heat, under a glass. There are about a dozen species (two of which are tropical African, and the rest tropical American), the best-known and most important being *C. officinalis*.

C. Jacquini (Jacquin's). A synonym of *C. officinalis*.

C. officinalis (officinal). Balsam of Copaiba. *l.* with two to five pairs of ovate, incurved, unequal-sided, bluntly acuminated leaflets, full of pellucid dots. *h.* 20ft. West Indies and tropical America, 1774. SYN. *C. Jacquini*.

COPERNICIA (named in honour of the celebrated German astronomer, Copernicus). ORD. *Palmæ*. A very small genus of about eight species of unarmed stove Palms, with erect trunks, covered with the remnants of the leaf-stalks. Flowers hermaphrodite or polygamous, on axillary spadices. Leaves fan-shaped, palmate, tufted. For culture, *see* **Corypha.** The best-known species, and the only one worthy of being described here, is *C. cerifera*.

C. cerifera (wax-bearing).* Carnaüba or Wax Palm of Brazil. This species is of economic value; the upper part of the stem yields a kind of sago; the young leaves are coated with wax,

Copernicia—*continued.*

which is detached by shaking them, and then melted and run into cakes. Brazil.

Other species are: *hospita*, *macroglossa*, *maritima*, *tectorum*, and *Wrightii*.

COPROSMA (from *kopros*, dung, and *osme*, a smell; in allusion to the fœtid odour emitted by the plants). ORD. *Rubiaceæ*. A genus comprising about thirty-five species of greenhouse shrubs, the majority of which are natives of New Zealand and the Sandwich Islands, a few are from Australia and Oceania, and one from Juan Fernandez. None are worth cultivating for the sake of their flowers; but some deserve a place in a large conservatory for their small coral-red fruits. Cuttings should be made in March, taken off with a heel of the old wood, and placed in pots two-thirds filled with crocks, above which is a thin layer of rich, light material, and on the top a layer of sand. The pots should then be put in brisk bottom heat, in a propagating frame. During the time the cuttings are making root, only a very light sprinkling with water should be given, or they will damp off. When rooted, they should be potted into rich sandy soil, and gradually hardened off in a cold frame. Another method is to place the plants in a propagating bed, and layer the shoots which overhang the pot. Old plants should be potted in a similar compost to that recommended above, and should be pruned into shape every year if necessary.

C. Baueriana picturata (Bauer's painted).* *l.* ovate, bluntly rounded; surface smooth, pale green, marked with blotches of pale yellow and creamy-white, spreading out from the midrib to one or both sides, and assuming a variety of grotesque forms. New Zealand, 1876. SYN. *C. Stockii*.

C. B. variegata (variegated).* *l.* obovate, moderate-sized, glossy, bright green in the centre, with very broad white marginal variegation, which is creamy-yellow in a young state. New Zealand, 1866. This is of compact habit, and forms, in time, a dense and handsome shrub.

C. Stockii (Stock's). A synonym of *C. Baueriana picturata*.

COPTIS (from *kopto*, to cut; in reference to the numerous divisions of the leaves). ORD. *Ranunculaceæ*. Very pretty little hardy evergreen bog plants, thriving well in a moist peat or very sandy moist soil. They may be propagated either by division of the roots, or by seed.

C. asplenifolia (Asplenium-leaved). *fl.* white; scape two-flowered, at first shorter than the leaves; petals five, very long and narrow, dilated and concave-cucullate in the middle, filiformly attenuated upwards. *l.* biternate; leaflets somewhat pinnatifid, acutely serrate. *h.* 1ft. North-west America and Japan.

C. occidentalis (Western).* *fl.* white; scape short, three-flowered; petals about six, not hooded. *l.* trifoliolate; leaflets petiolulate, broadly ovate. *h.* 6in. to 1ft. Rocky Mountains.

C. orientalis (Eastern). *fl.* white; scape about three-flowered. *l.* ternate, each of the divisions pinnate at base, and pinnatifid above; lobes deeply cut. *h.* 3in. to 9in. Japan, 1873.

C. trifolia (three-leaved).* *fl.* white, small; scape one-flowered. April to July. *l.* trifoliolate; leaflets obovate, blunt, toothed, hardly three-lobed. Roots bright yellow, fibrous. *h.* 3in. to 5in. Northern hemisphere, 1782. (B. M. Pl. 3.)

CORAL BERRY. A common name for **Symphoricarpus vulgaris** (which *see*).

CORAL-BUSH. A name applied to **Templetonia retusa** (which *see*).

CORAL-TREE. A common name for the genus **Erythrina** (which *see*).

CORBULARIA. *See* **Narcissus.**

CORCHORUS (from *koreo*, to purge, and *kore*, the pupil; in allusion to the supposed medicinal qualities of *C. olitorius*). ORD. *Tiliaceæ*. A genus of small shrubs or herbs. Peduncles opposite the leaves or axillary, one, two, or three-flowered; corolla yellow, small. Leaves simple, serrated, covered with simple or stellate hairs. *C. capsularis* (Jute Plant) and *C. olitorius* are stove annuals, natives of India, both attaining a height of 6ft. They have no horticultural value.

CORDATE. Heart-shaped. A Cordate leaf with dentate margin is shown at Fig. 510.

FIG. 510. CORDATE LEAF, WITH DENTATE MARGIN.

CORDIA (named after Euricius Cordus, whose true name was Henricus Urbanus, 1486-1535, and Valerius, his son, 1515-1544). SYN. *Varronia.* ORD. *Borragineæ.* A very large genus, comprising about two hundred species of stove or greenhouse evergreen trees and shrubs, of considerable beauty. Inflorescence terminal. Flowers sessile, in dichotomous scorpioid cymes, spikes, or densely-packed heads; corolla funnel-shaped or campanulate, five-toothed. Leaves quite entire, or toothed. They thrive in a mixture of loam, peat, and sand, or any light rich soil. Cuttings strike root readily when planted in sand, with a hand glass placed over them, in heat.

C. decandra (ten-stamened).* *fl.* white, large, very showy, fragrant, disposed in a terminal leafy corymb; corolla ten-toothed. *l.* linear-lanceolate, attenuated, scabrous, sessile, with revolute edges, hoary from down. *h.* 3ft. Chili, 1875. A very handsome greenhouse shrub. (B. M. 6279.)

C. Gerascanthus (Spanish Elm). *fl.* large, verticillate, sessile; racemes usually four together, 3in. to 4in. long; corolla white, throat villous; calyx ten-furrowed, ten-striped, downy. May. *l.* ovate-oblong, acute, quite entire, glabrous, unequal at the base, 3in. to 4in. long. *h.* 30ft. West Indies, 1789. Tree.

C. glabra (glabrous). *fl.*, corolla white, 1¼in. long, campanulately funnel-shaped, glabrous; cymes bifid or trifid, scorpioid, terminal, but at length lateral. Autumn. *l.* scattered, opposite, and three in a whorl, on short petioles, lanceolate, narrowed at both ends, 6in. long, membranous, flat. Brazil, 1868. Shrub. Tops of branches, inflorescence, and petioles, scabrous from small bristles or stiff hairs. (B. M. 5774.)

C. Myxa (Myxa).* *fl.*, divisions of corolla revolute; panicles terminal and lateral, globular. *l.* oval, ovate, or obovate, repand, smooth above, but rather scabrous beneath, 2in. to 3in. long, 1¼in. to 2in. broad. *h.* 10ft. to 15ft. India, 1640. Tree.

FIG. 511. FLOWERING BRANCH OF CORDIA NIVEA.

C. nivea (snowy). *fl.* white, borne in heads or spike-like clusters at ends of branches; calyx clothed with white hairs. *l.* petioled, ovate or ovate-oblong, crenate, dentate. Branches, leaf-stalks, and peduncles tomentose. *h.* 3ft. Brazil. Shrub. See Fig. 511.

C. Sebestena (Sebestena). *fl.*, corolla orange-coloured, funnel-shaped; limb spreading, five to seven-parted, with crenately undulated edges; peduncles terminal, corymbose. June to August. *l.* ovate, acute, or elliptic, quite entire, hispid, scabrous above, 4in. to 5in. long. *h.* 10ft. to 35ft. Cuba, 1728. Tree. (B. M. 794.)

C. superba (superb).* *fl.*, corolla white, campanulately funnel-shaped, large, showy; cymes at first terminal, then lateral,

Cordia—*continued.*

pedunculate. *l.* cuneate-oblong to oblong-elliptic, acuminated, acute, toothed in front; the largest are 6½in. long and 2½in. broad. Brazil. Tree. (B. M. 4888.)

CORDIACEÆ. This natural order takes its name from the large genus *Cordia.* By Bentham and Hooker, and other authorities, it is now merged into *Borragineæ.*

CORDONS. *See* **Training.**

CORDYLINE (from *kordyle*, a club; in allusion to the large fleshy roots of some of the species). Club Palm. SYN. *Tætsia.* ORD. *Liliaceæ.* A genus of greenhouse or stove Palm-like plants, usually erect, unbranched, bearing a tuft of long, narrow, drooping leaves at the summit of the trunk, which in some species acquires a height of 30ft. to 40ft. Some authors regard Mr. Baker's sections as distinct genera: *Calodracon*, examples *Banksii* and *terminalis*; *Dracænopsis*, examples *australis*, *indivisa*, and *pumilio*; *Charlwoodia*, example *stricta.* Flowers white, small, solitary, in branched panicles, rarely produced on young plants; bracts two in number, one at the base of the pedicel, where it joins the peduncle, is simple; the other, opposite to it, and consequently placed in the axil of the pedicel and peduncle, is much shorter, broader, and is double, being either bifid or bipartite, always having two nerves. For culture, *see* **Dracæna.** In the following enumeration are included some of the half-score "true" species of *Cordyline*, and a great many sorts known in gardens as Dracænas, but which are nearly all varieties of *Cordyline terminalis*, a species cultivated everywhere throughout the tropics, and producing innumerable varieties from seed.

C. albicans (whitish).* *l.* long, narrow, pointed, about 2in. broad, narrowed into a long channelled petiole; bright green, with a pale green or whitish border, breaking out, in well-grown matured plants, into a conspicuous white variegation. 1869. Stove.

C. albo-rosea (white and red).* *l.* deep green, edged with rose; whitish when in a young state. 1874. Stove.

C. amabilis (lovely).* *l.* 24in. to 30in. long by 4in. to 5in. wide; ground-colour bright glossy green, which, as the plant grows, becomes marked and suffused with pink and creamy-white; young leaves in large specimens quite rosy. 1871. Stove.

C. amboynensis (Amboynan).* *l.* oblong-lanceolate, acuminate, deep bronzy-tinted green, the lower half having a distinct edging, ¼in. wide, of bright rosy-carmine; petioles tinted with rosy-purple; spreading and gracefully arched. Amboyna, 1876. Stove.

C. angusta (narrow). *l.* narrow, arching, about 1in. wide, narrowed and compressed at the base into a purplish stalk; dull dark green above, tinted with purple beneath, and becoming slightly bronzed in age. 1869. A slender-growing stove species.

C. australis (Southern).* *fl.* white, densely crowded, sweet-scented, ¾in. across. *l.* oblong-lanceolate, 2ft. to 3ft. long, and 2in. to 4in. broad, striated with numerous parallel veins. New Zealand, 1823. A very fine species for sub-tropical gardening, with a stout-branched stem, from 10ft. to 40ft. high. Hardy in warmer parts of England and Ireland. (B. M. 5535.)

C. a. lineata (lined).* A very handsome and ornamental plant, with fine, broad, gracefully recurving foliage.

C. Balmoriana (Balmore's). *l.* bronzy, with white and rosy stripes. 1875. Stove.

C. Banksii (Banks's). *fl.* white, loose, very much larger than the bracts. *l.* very long, linear-lanceolate, 5ft. to 6ft. long by 1½ft. to 2ft. broad, closely striate, and also having six to eight very evident veins on each side of the prominent midrib. Stem sub-arboreous, 5ft. to 10ft. high, simple or sparingly branched. New Zealand, 1860. Greenhouse. (R. G. 444.)

C. B. erythrorachis (red-ribbed) is a form with red midrib.

C. Baptistii (Baptist's).* *l.* 18in. to 24in. long; ground-colour green, margined and striped with yellow and pink. 1873. A very distinct form, having the stem, as well as the leaves, variegated. Stove. (I. H. n. s. 334.)

C. bellula (pretty). *l.* purplish, margined with red, small. 1874. Stove. (I. H. n. s. 163.)

C. cannæfolia (Canna-leaved).* *l.* on long petioles, somewhat oblong, with an obtuse apex, which, however, is frequently split; 1ft. to 2ft. long, and 3in. to 5in. wide, slightly recurved, dark green. Queensland, &c., 1820. An elegant stove species, growing to a considerable height. See Fig. 512.

C. chelsoni (Chelsea).* *l.* large; ground-colour a glossy dark green, almost black, which, as the plant attains age, becomes mottled and suffused with deep crimson, a broad line of the same colour bordering the leaves on either side. 1870. A remarkable stove sort, with a bold free growth. (I. H. 19, 90.)

Cordyline—*continued.*

C. compacta (compact). *l.* numerous, crowded, recurved, about 7in. long, and nearly 3in. broad, oblong-ovate, of a dull green, with a slightly bronzy tint, and breaking out into broad streaks of rose-colour when fully developed; petioles 2in. long, margined and tinted with rose. 1873. Stove.

C. Cooperii (Cooper's).* An elegant variety of *C. terminalis*, with deep vinous-red gracefully-recurved leaves. One of the best for decorative work. Stove.

C. Dennisoni (Dennison's). *l.* 12in. to 15in. long, and 4in. to 5in. broad, bronzy-purple. 1871. Habit dwarf and compact. Stove. (I. H. 19, 360.)

C. Duffii (Duff's).* *l.* oblong, 6in. to 8in. wide, glossy, margined and casually barred with rich crimson; the parallel margins of the channelled petiole leaf-base converging, and elegantly shaded with light-flamed crimson. 1874. A very beautiful and robust-habited variety, of erect and stately growth. Stove.

C. excelsa (lofty).* *l.* broadly-oblong, acute, narrowed at the base into a stalk; arching, of a deep bronzy hue, margined towards the base, and also on the wing of the petiole, with a broad edge, ¼in. wide, of a very deep crimson-lake; this bright colour is sometimes continued throughout the margin of the leaf, and at others breaks into rays and blotches. 1869. Stove.

FIG. 512. CORDYLINE CANNÆFOLIA.

C. Fraseri (Fraser's).* *l.* somewhat erect, oblong, 1ft. or more in length by 5in. broad, abruptly acute at the apex, suddenly narrowed into the petiole, which is about 3in. long; blackish-purple, with a glaucous bloom, the lower portion having a margined stripe of deep rosy-lake, which extends down the edge of the petiole. 1873. Stove.

C. gloriosa (glorious).* *l.* broad-oblong, 2½ft. long by 5in. broad, with channelled marginate petioles 6in. long, the edges of which are tinted with the same colour, and it is continued along the marginal portion of the lower half of each leaf; the older leaves of this plant colour gradually, the young ones being green, and showing paler green stripes on those parts which, at a later period, have the peculiar bronzy-orange hue. 1872. Stove. SYN. *C. Shepherdi.* (I. H. 20, 85.)

C. grandis (grand). *l.* deep and bright green, bordered with white and edged with rose. Samoa, 1874. Stove.

C. Guilfoylei (Guilfoyle's).* *l.* from 1½ft. to 2ft. long, 1½in. to 2in. wide in the middle, and tapering off both ways, striped with red, light rosy-pink, very pale yellowish-white, and green, a whitish variegation invariably following the lower margins of leaf and leafstalk to its juncture with the stem. Australia, 1868. This

Cordyline—*continued.*

is a very pretty variety, with elegantly recurved foliage. Stove. (I. H. 19, 249.)

C. imperialis (imperial).* *l.* of an erect arching habit, oblong, acuminate, 1½ft. to 2ft. long by 3in. or 4in. wide, deep green, rayed all over with bright crimson, or pale pink in the young leaves. 1872. The foliage is very leathery, and has a peculiar metallic hue, which contrasts well with the crimson variegation. (F. & P. 1875, 62.)

FIG. 513. CORDYLINE INDIVISA.

C. indivisa (undivided).* *l.* 2ft. to 4ft. long, 1in. to 2in. broad, tapering to a point, pendent, and dark green. New Zealand. A very graceful plant for decorative purposes. Greenhouse. See Fig. 513.

C. i. atropurpurea (dark purple).* A handsome form, having the base of the leaf and midrib on the under side dark purple.

C. i. lineata (lined). *l.* much broader than those of the type, about 4in. broad; sheathing base stained with reddish-pink.

C. i. Veitchii (Veitch's).* Similar to the type, but has the sheathing base and back of midrib of a beautiful deep red.

C. i. vera (true). *l.* excessively thick and leathery, 2ft. to 5ft. long, and from 2in. to 4in. wide, lanceolate, dark shining green; midrib and veins of a rich deep orange. Stem simple, 2ft. to 5ft. high. New Zealand. SYNS. *C. indivisa, Dracæna aureo-lineata.*

C. indivisa (undivided). A synonym of *C. i. vera.*

C. inscripta (inscribed). *l.* small, linear-oblong, 5in. long by 1in. broad, tapering to a point, and at the base narrowed into the margin of the petiole; colour lively green, streaked with thin lines of dull purple, which here and there break into linear markings of rose-colour; petioles erect, 2½in. long, flushed with purple. 1873. The leaves have a twisted appearance, from the irregular undulations of the margins. Stove.

C. lutescens-striata (yellowish-striped).* *l.* long, gracefully arching, fresh grass-green above, yellowish-green on the under side. 1873. Stove. (I. H. 1871, 72.)

C. Macarthuri (MacArthur's).* *l.* carmine and olive-green. 1877. Stove.

C. magnifica (magnificent).* *l.* 1½ft. to 2ft. long, sometimes 10in. in width, of a beautiful bronzy-pink colour, changing when old to a somewhat darker shade; petioles nearly purple. 1869. Stove. See Fig. 514.

C. metallica (metallic).* *l.* oblong-acuminate, somewhat erect and arching, 16in. long, of a uniform rich coppery-purplish hue when young, becoming a dark purplish bronze when mature; petioles sheathing, 4in. long, of the same colour as the leaves 1869. Stove. (F. M. n. s. 24.)

C. mirabilis (wonderful). *l.* oblong-lanceolate, very gracefully recurved, of a bronzy-green colour, margined with bright crimson-rose. 1880. Stove.

C. Mooreana (Moore's).* *l.* 4in. wide, 2ft. to 3ft. long, beautifully undulated, deep bronzy-purple; the base of the leafstalk and the midrib of a bright reddish-crimson colour. 1868. Stove.

Cordyline—*continued.*

C. nigro-rubra (black and red).* *l.* linear-lanceolate, dark brown, with bright rosy-crimson centres, the young foliage usually entirely of the latter showy colour. A fine variety, of bold erect growth. Stove.

C. ornata (adorned).* *l.* small, recurved, oblong, 8in. long, 2in. broad, dark bronzy-green, marked with a narrow margin of rosy-pink, which is continued along the edge of the petioles; petioles almost erect. 1873. Stove.

C. porphyrophylla (purple-leaved). *l.* broadly ovate-oblong, of a fine deep bronzy hue, contrasting well with the glaucous tint of their under surfaces. Habit somewhat erect-growing. 1870. Stove. (I. H. 1872, 277.)

C. pulchella (beautiful).* *l.* nearly 1in. wide, deeply bronze-tinted, of a spreading-arching habit; the contracted petiole-like base being of a deep wine-red, which colour also marks the edges of the leaves. 1870. Stove.

Cordyline—*continued.*

C. rosacea (rose-coloured). *l.* gracefully recurving, oblong-acuminate, dark bronzy-green, broadly margined with bright pink; some of the young ones almost entirely of a light creamy-pink colour. 1872. A compact-habited dense-growing variety. Stove.

C. rubella (reddish). *l.*, young ones variegated with bluish-rose. 1872. Stove.

C. Shepherdi (Shepherd's). A synonym of *C. gloriosa.*

C. spectabilis (showy). *l.* broad oblong-acute, arching, narrowing and compressed at the base into a longish green stalk; of a deep full green, slightly bronzed from being tinged beneath with reddish-purple. 1869. An erect free-growing plant. Stove.

C. splendens (splendid).* *l.* dense, short, ovate-acute, about 9in. long, 4in. broad, arranged spirally; of a deep bronzy-green, breaking out in the young growth into bright rosy-carmine; the petioles and bases of the leaves are margined with the same colour. 1871. Stove. The colouring sometimes appears in stripes, and at others occupies the whole surface; while the recurved character of the foliage gives the plant a flat, almost table-like head.

FIG. 514. CORDYLINE MAGNIFICA.

C. pumilio (dwarf). *fl.* white; panicle very lax, spreading, 2ft. long, with slender branches. *l.* very narrow, linear, 1½ft. to 2½ft. long, ¼in. to ½in. broad, with a stout prominent midrib, and a few slender veins on each side of it. Trunk short, slender, as thick as the finger, or none. New Zealand, northern islands. Greenhouse.

C. Reali (Real's). *l.* dark green, striped and edged with rose. 1874. Stove. (I. H. 20, 140.)

C. Rex (king).* *l.* erect, broadly or oblong-lanceolate, about 1ft. long, of a bronzy-green colour, flushed with rosy-purple, freely streaked with bright carmine-rose; petioles margined with purplish-rose, and the back of the costa is of the same colour. 1875. Stove.

C. Robinsoniana (Robinson's).* *l.* long, lanceolate-acuminate, elegantly arched; ground-colour light green, variously striped and marked with dark bronzy-green and brownish-crimson; petioles also striped with brownish-crimson. 1877. Stove. (I. H. 1879, 342.)

C. stricta (upright). *fl.* light blue, rather crowded. *l.* linear-lanceolate or narrowly ensiform, contracted for some way above the bases, 1¾ft. to 2½ft. long, 1in. to 1¼in. broad, with slightly roughened margins; indistinct midrib striated with numerous parallel nerves. Trunk slender, simple, 6ft. to 10ft. high. Moreton Bay. SYN. *Dracæna stricta.* Greenhouse. (B. M. 2575.)

C. s. congesta (crowded) differs from the type in having broader and more crowded foliage. See Fig. 515.

C. sulcata (grooved). *l.* spreading, oblong, abruptly pointed; upper surface scored with numerous shallow parallel furrows, following the obliquely transverse direction of the veins; under surface slightly streaked with blackish-purple; petioles purplish. 1872. Stove.

C. terminalis (terminal).* *fl.* sub-sessile, in branched panicles. *l.* petioled, lanceolate, narrowed to both ends, dark green or

Cordyline—*continued.*

bronzy, and crimson. *h.* 10ft. to 12ft., when fully mature. South Sea Islands, and cultivated everywhere in tropical countries. From this species have originated the host of popular stove so-called Dracænas. See Fig. 516.

C. triumphans (triumphant).* *l.* narrow-lanceolate, appearing to taper into the stalk by the incurving of the winged edges of the petiole, while in the upper part the blade assumes a half-channelled form; black-purple, relieved by the glaucous hue of the under surface and of the petioles, while the edges of the young leaves towards the centre are deeply margined with rose-colour. 1875. Stove.

COREMA (from *korema*, a broom; referring to the habit of the plant). Broom Crowberry; Portugal Crakeberry. SYN. *Tuckermannia.* ORD. *Empetraceæ.* A genus comprising two species of hardy, much-branched, low-growing, Heath-like shrubs, of rigid habit, closely allied to *Empetrum.* Flowers dicœcious; perianth segments five or six, scale-like, sub-petaloid, much imbricated. Male: stamens three (rarely four). Female: ovary sub-globose, three (rarely two or four) celled. Drupe sub-globose. For culture, *see* **Empetrum.**

FIG. 515. CORDYLINE STRICTA CONGESTA.

FIG. 516. CORDYLINE TERMINALIS.

C. Weismanni (Weismann's).* *l.* rather narrow, gracefully recurved; in a young state, light coppery-red, more or less tinged with creamy-white, changing with age to a deep bronzy hue, except at the edges, where they are margined with red. 1871. Stove.

C. Youngi (Young's).* *l.* broad, of a somewhat spreading habit, without being pendulous; in a young state, bright light green, streaked with deep red, and tinged with a rosy hue, changing with age to a bright bronze. 1872. A robust and rapid grower. Stove.

C. alba (white). *fl.* white, in terminal groups. Spring. *fr.* a white, three-seeded, globose berry. *l.* obtuse, small, narrow, with revolute edges, sprinkled with resinous dots. *h.* 1ft. South-western Europe and Azores, 1774.

C. Conradii (Conrad's). *fl.* with tufted purple filaments, and purple-brown anthers. April. *l.* scattered or nearly whorled, narrowly linear. *h.* 6in. to 9in. North America and Newfoundland.

COREOPSIS (from *koris*, a bug, and *opsis*, like; referring to the appearance of the seed). ORD. *Compositæ.*

Coreopsis—*continued.*

A genus of showy annual or perennial herbaceous plants. Involucral bracts in two rows, the outer spreading, and the inner combined at the base and erect; receptacle furnished with linear chaffy scales. Leaves opposite, simple, or sub-pinnate. Seeds flat on one side, convex on the other, membranous at the edge, and the pappus with two horns. Several species of this genus are very handsome, having a distinct, bright-coloured disk. The hardy annuals are largely grown, under the name of *Calliopsis*, for summer ornamentation; for which purpose seed should be sown in March, in a gentle heat, or outside late in April. The perennials are also of easy culture in ordinary garden soil, and may be propagated by divisions of the root, in autumn or spring; or, during the summer, by young cuttings, which will strike freely in a cold frame. Annuals, except where otherwise mentioned.

C. aristosa (bearded). *fl.-heads* orange-yellow, large, numerously produced in a terminal panicle. September. *l.* deeply pinnatifid, with coarse, lanceolate segments, glabrous, much branched. *h.* 3ft. United States, 1869. See Fig. 517.

C. aurea (golden). *fl.-heads* with golden-yellow rays; disk-flowers dull yellow. Autumn. *l.* various, more commonly three to seven-divided, with lanceolate divisions. *h.* 1ft. to 3ft. United States. A glabrous biennial. See Fig. 518.

C. auriculata (auricled).* *fl.-heads* yellow, with a band of purplish-brown encircling the disk, generally solitary; peduncles very long and slender. Summer. *l.* entire, or sometimes three-lobed. *h.* 1ft. to 1½ft. United States, 1699. Perennial. See Fig. 519.

FIG. 517. FLOWERS OF COREOPSIS ARISTOSA.

Coreopsis—*continued.*

C. bicolor. A synonym of *C. tinctoria.*

C. cardaminefolia (Cardamine-leaved). *fl.-heads* yellow; lower part of ray-florets brown-purple. Summer. *l.* once or twice pinnately divided. *h.* 6in. to 2ft. United States. See Fig. 520.

FIG. 518. FLOWERS AND BUDS OF COREOPSIS AUREA.

C. coronata (crowned). *fl.-heads* orange, spotted with brownish-purple; peduncles elongated. Summer, autumn. *l.* opposite, in remote pairs, spathulate, tapering at base, undivided, or cut in a pinnated manner. Stem erect. *h.* 2ft. Texas, 1835. (B. M. 3460.)

C. diversifolia (diverse-leaved). A synonym of *C. Drummondi.*

C. Drummondi (Drummond's).* *fl.-heads* yellow, with a circle of rich crimson-brown around the eye. Summer. *l.* pinnate, with ovate or lanceolate lobes. *h.* 1ft. Texas, 1834. A dwarf, spreading, slightly hairy species. SYN. *C. diversifolia.* See Fig. 521. (B. M. 3474.)

C. grandiflora (large-flowered).* *fl.* bright yellow; ray-florets five-toothed, deeply cut; peduncle elongated, one-flowered. Summer. *l.* opposite, connate, almost sessile, fringed with hair at the base. *h.* 3ft. to 4ft. United States, 1826. Perennial. (S. B. F. G. 175.)

C. lanceolata (lance-shaped).* *fl.-heads* bright yellow, 2in. to 3in. across; ray-florets four-toothed; peduncles long, usually one-flowered. Summer. *l.* lanceolate, entire, fringed with hairs; upper ones slightly connate at the base. Stem sometimes branched at the base. *h.* 1ft. to 3ft. North America, 1724. Perennial.

C. maritima. *See* **Leptosyne maritima.**

C. nudata (naked). *fl.-heads* pale bluish, or violet, the size of a small single Dahlia. August. *l.* few, opposite, linear subulate, rush-like. *h.* 2ft. to 4ft. Florida (swamps), 1879. (B. M. 6419.)

C. rosea (rose). *fl.-heads* with rose-red rays and yellow disk-flowers; ray-florets coarsely three-toothed or lobed. Summer. *l.* opposite, linear or nearly so, entire, or the lower ones two to three-toothed or tripartite. *h.* 1ft. United States.

C. tenuifolia (slender-leaved). A synonym of *C. verticillata.*

C. tinctoria (colouring).* *fl.-heads* yellow, with a purple-brown blotch at the base; ray-florets few, broad, jagged at the tip. *l.* pinnate; segments linear. *h.* 2ft. United States. A very pretty slender-growing annual, of which there are several varieties, differing in the colour of the flowers. SYN. *C. bicolor.* (B. M. 2512.)

C. t. nana (dwarf). *fl.-heads*, rays yellow above, brown-purple towards the base. *h.* 6in. to 1ft. A beautiful plant, differing from the type in its dwarfer habit. See Fig. 522.

Coreopsis—*continued.*

FIG. 519. FLOWERING BRANCH OF COREOPSIS AURICULATA

FIG. 520. COREOPSIS CARDAMINEFOLIA, showing Habit, detached Leaf, and Portion of Inflorescence.

Coreopsis—*continued.*

FIG. 521. COREOPSIS DRUMMONDI, showing Habit and Flower-head.

FIG. 522. COREOPSIS TINCTORIA NANA, showing Habit, detached Leaf, and Flower-head.

FIG. 523. COREOPSIS VERTICILLATA, showing Habit and Flower-head.

Coreopsis—*continued.*

C. tripteris (three-winged). *fl.-heads* yellow and brown; disk turning brownish. Autumn. *l.* opposite, stalked, three to five-divided; leaflets lanceolate, acute, entire. *h.* 4ft. to 9ft. United States. Perennial. The flower-heads, when bruised, exhale the odour of Anise. SYN. *Chrysostemma tripteris* (under which name it is figured B. M. 3553).

C. verticillata (whorled). * *fl.-heads* rich golden yellow, 1¼in. across, numerous, erect, solitary on the ends of the many subdivisions of the branches. Summer. *l.* much divided into linear segments, whorled. Stem furrowed, branched. *h.* 1ft. to 2ft. United States, 1780. Perennial. SYN. *C. tenuifolia.* See Fig. 523.

CORETHROSTYLIS (from *korethron*, a broom, and *stylos*, a style; referring to the consolidated styles being clothed with hairs). ORD. *Sterculiaceæ*. There are about eight species, all from Australia, which may be referred to this genus. It is, however, now generally sunk under *Lasiopetalum*. Greenhouse evergreen shrubs, thriving best in a compost of peat and silver sand, with the addition of a little charcoal. Propagated by cuttings of young or half-ripened wood, inserted in sandy soil, under a bell glass.

C. bracteata (bracteate). *fl.* rose-coloured, cymosely racemose, opposite the leaves; bracts leafy, rose-coloured. April. *l.* cordate, entire. Plant beset with stellate hairs. *h.* 3ft. 1843. (B. R. 1844, 47.)

CORIACEOUS. Of the consistence of leather; thick and tough.

CORIANDER. *See* **Coriandrum.**

CORIANDRUM (a name used by Pliny, derived from *coris*, a bug; in reference to the fœtid smell of the leaves). Coriander. ORD. *Umbelliferæ*. *C. sativum* is a hardy annual, native of Southern Europe, but occasionally found in a semi-wild state, in waste places in the South and East of England. The young leaves of this plant are occasionally employed in soups and salads, and the seed are used in confectionery, and for other flavouring purposes. They ripen about August, and should be sown, in a warm position, in autumn, and again in spring. If the leaves are required, small quantities of seed should be sown about every month for succession, in drills 1ft. apart.

C. sativum (cultivated). *fl.* white; umbels of three or four rays, without any involucre; involucels of three dimidiate leaves. *l.* decompound. Stems terete. *h.* 1½ft.

CORIARIA (from *corium*, a hide; referring to the crustaceous covering of the fruit). ORD. *Coriarieæ*. Ornamental dwarf-growing suffruticose shrubs, natives of South Europe, North Africa, Japan, Himalayas, New Zealand and the Andes. Flowers green, small, hermaphrodite, or polygamous; sepals five, spreading, imbricate, persistent; petals smaller than the sepals, thickened after flowering, and embracing the fruit; stamens ten, hypogynous, free, or the alternate adnate to the petals; racemes axillary. Carpels five to ten. Leaves opposite, rarely ternately whorled, quite entire, sessile, exstipulate. Coriarias are of easy culture in common garden soil. Propagated by suckers or layers, put down in autumn. *C. myrtifolia* is the only hardy species; the two others mentioned do well in a conservatory or cool greenhouse.

C. myrtifolia (Myrtle-leaved).* Myrtle-leaved Sumach; Tanners'-tree. *fl.* greenish; racemes rather erect, terminating the branches and branchlets, leafy at the base. May to August. *l.* ovate-lanceolate, simple, opposite. Branches somewhat tetragonal, opposite or tern. *h.* 4ft. to 6ft. South Europe, 1629.

C. nepalensis (Nepaulese). *fl.* brown. May. *h.* 10ft. Nepaul.

C. sarmentosa (sarmentose). *fl.* green. June. *h.* 3ft. New Zealand, 1823. (B. M. 2470.)

CORIARIEÆ. An interesting natural order, consisting of but the single genus *Coriaria*, from which it takes its name.

CORIS (a name adopted from Dioscorides). ORD. *Primuleæ*. The only species of this genus is a pretty dwarf branching hardy perennial. It thrives on sunny parts of rockwork, in a dry, sandy, peaty soil. Increased by seed, sown, as soon as ripe, in a cold frame.

C. monspeliensis (Montpelier).* *fl.* bright lilac, with orange anthers; disposed in elongated terminal heads. Summer. *l.* linear, acute, with revolute margins, sessile, patent, clothing the stem from the base to the top. *h.* 6in. Mediterranean region, 1640. (B. R. 536.)

CORK-TREE. *See* **Quercus Suber.**

CORNACEÆ. A small order of trees or shrubs, rarely herbs. Flowers in terminal or axillary umbels, cymose clusters, or sometimes involucrate heads. Leaves opposite or alternate, exstipulate. There are about twelve genera, the three best-known being: *Aucuba*, *Cornus*, and *Garrya*.

CORN BLUE-BOTTLE. A common name of **Centaurea Cyanus** (which *see*).

CORN COCKLE. *See* **Githago segetum.**

CORNEOUS. Horny; of the consistence of horn.

CORN FLAG. *See* **Gladiolus.**

CORNICULATE. Having processes like small horns.

CORNISH MONEYWORT. *See* **Sibthorpia europæa.**

CORN MUSTARD. *See* **Sinapis arvensis.**

CORN SALAD, or **LAMB'S LETTUCE** (*Valerianella olitoria*). Annual. This is not largely used in this country, but still, it makes a very good change in the salad bowl. In summer, the whole plant may be used, as it is then tender, being in active growth. About four sowings will be found sufficient, and, if these are made in February, April, August, and September, a fair supply will be kept up, quite sufficient for any ordinary household. The ground should be deeply dug, but it need not be heavily manured. Sow the seed in rows, about 9in. asunder, and thin out to 6in. apart in the rows. Keep the plants clear of weeds, and, in winter, during hard frost, throw a little dry litter over the bed.

FIG. 524. CORN SALAD.

Sorts. The common Corn Salad (see Fig. 524), the Round-leaved (a stronger-growing form, with larger leaves), and the Italian, are the varieties usually cultivated. The latter is supposed to belong to another species.

CORNUS (from *cornu*, a horn; the wood is thought to be as hard and durable as horn). Dogwood. ORD. *Cornaceæ*. Hardy deciduous trees and shrubs, sometimes low herbs. Flowers sometimes capitate and umbellate, involucrated; sometimes corymbose and panicled, without involucre. Leaves, with few exceptions, opposite, entire, sometimes alternate or in whorls. All the woody species are desirable for shrubberies. Many will grow under the drip of trees; this renders them valuable for thickening strips of plantations which have become naked below. They may be readily increased by cuttings, by layers, or by suckers, either of which operations should be performed in autumn. *C. canadensis* and *C. suecica* should be grown in sandy peaty soil, in a rather shady situation, on the rockery, or in a border; they may be increased by dividing, when the plants have run considerably at the roots. *See also* **Benthamia.**

C. alba (white). A synonym of *C. stolonifera.*

C. canadensis (Canadian).* Bunch-berry, Dwarf Cornel. *fl.* purplish-white, umbellate, much shorter than the leaves of the involucre, which are white, ovate, and acuminated. May. *l.*, upper ones in whorls, ovate, acuminated, veiny, on short petioles. Stems simple, herbaceous. *h.* 6in. North America, 1774. Small herb. See Fig. 525. (B. M. 880.)

C. circinata (round-leaved). Round-leaved Cornel. *fl.* white; cymes flat. June. *fr.* spherical, light blue. *l.* larger than in most other species, round, oval, abruptly-pointed, clothed with

Cornus—*continued.*

hoary tomentum beneath. Branches warted, greenish. *h.* 5ft. to 10ft. United States, 1784. Shrub. (T. S. M. ed. ii. 464.)

FIG. 525. CORNUS CANADENSIS.

FIG. 526. FLOWERS OF CORNUS FLORIDA.

C. florida (Floridan).* Flowering Dogwood. *fl.* greenish-yellow, umbellate, rising after the leaves. April. *l.* ovate, acuminate, pale beneath, and beset with adpressed hairs on both surfaces; bracts of the involucre large, white, roundish, retuse or nearly obcordate. *fr.* oval. *h.* 20ft. to 30ft. United States, 1731. This is a beautiful tree; the bark is extremely bitter. See Fig. 526. (B. M. 527.)

C. mas (male).* Cornelian Cherry. *fl.* yellow, rising before the leaves; umbels about equal in length to the four-leaved involucre.

Cornus—*continued.*

February to April. *l.* oval, acuminated, rather pubescent on both surfaces. Branches smoothish. *h.* 10ft. to 15ft. Europe (Britain excepted), 1599. SYN. *C. mascula.* (S. F. G. 151.) Of this there is a form (*variegata*) having leaves variegated with white, and another (*elegantissima*) in which the foliage is beautifully marked with creamy-white and tinged with red. Both are excellent garden plants.

C. mascula (manly). A synonym of *C. mas.*

C. oblonga (oblong). *fl.* white or pale purplish, fragrant; calyx clothed with adpressed silvery hairs, as well as the pedicels and petals; corymbs spreading, panicled. *l.* oblong, acuminated, acute at the base, glaucous and rather scabrous beneath, with many excavated glands along the axils of the ribs and nerves. *h.* 10ft. to 15ft. Nepaul, 1818. Tree.

C. paniculata (panicled).* *fl.* white; cymes convex, loose, often panicled; ovary silky. July and August. *fr.* white. *l.* ovate acuminated, glabrous, hoary beneath. Branches erect, pale purplish. *h.* 4ft. to 8ft. United States, 1758. Shrub. (T. S. M. ed. ii., 465.)

C. sanguinea (blood-coloured).* Dogberry; common Dogwood. *fl.* greenish-white, not pleasantly scented; cymes corymbose, ebracteate; petals revolute at the sides. June. Berry small, black. *l.* ovate, or ovate-oblong, acute, pubescent, 2in. to 3in. long. Branches straight, of a dark red when full grown. *h.* 6ft. to 8ft. Europe (Britain), North and West Asia, Himalayas. Shrub. Wood used for skewers, formerly for arrows; and by gunpowder makers. The berries yield an oil, used in France for soapmaking. (Sy. En. B. 635.)

C. sericea (silky).* *fl.* white; corymbs depressed, woolly. June and July. Berries pale blue, globose. *l.* ovate, acuminated, clothed with rusty pubescence beneath. Branches spreading; branchlets woolly. *h.* 5ft. to 8ft. United States, 1683. (T. S. M. ed. ii., 466.)

C. stolonifera (stoloniferous). Red Osier Dogwood. *fl.* white; cymes small, flat. May. *l.* ovate, acute, pubescent, hoary beneath. Branches, especially the annual shoots, of a bright red-purple colour; branchlets glabrous. *h.* 4ft. to 10ft. North America, 1741. SYN. *C. alba.* There are several varieties of this shrub.

C. stricta (upright).* *fl.* white; cymes loose, flattish. June. *l.* ovate, acuminated, glabrous, green on both surfaces. Branches straight, fastigiate, reddish-brown. *h.* 8ft. to 15ft. United States, 1758. Shrub. There is a form having leaves variegated with white or yellow.

S. suecica (Swedish).* *fl.* dark purple, in terminal umbels, supported by four white bracts, which finally turn green. June. Berries red, sweetish. *l.* opposite, sessile, ovate. *h.* 6in. North and Arctic Europe (Britain), Asia, and North America.

CORNUTIA (named after Jacques Cornutus, a French physician, who travelled in Canada; he died in Paris, in 1651, after publishing his "Historia Plantarum Canadensium"). SYN. *Hosta.* ORD. *Verbenaceæ.* A small tropical American genus, containing about six species of ornamental greenhouse evergreen shrubs, allied to *Callicarpa.* They succeed well in a mixture of loam and peat. Cuttings strike readily in sand, if placed under a glass, in bottom heat, during February or March. Perhaps the only species in cultivation is *C. pyramidata.*

C. punctata (dotted). A synonym of *C. pyramidata.*

C. pyramidata (pyramidal). *fl.* blue; panicle terminal, naked, elongated. July. *l.* elliptical, ovate, toothed, hoary. *h.* 4ft. West Indies, 1733. SYN. *C. punctata.* (B. M. 2611.)

COROKIA (from *Korokia*, the native name). ORD. *Cornaceæ.* A genus containing a couple of species of ornamental half-hardy evergreen shrubs, confined—as far as is at present known—to New Zealand. Flowers axillary or terminal, solitary, or in panicles; calyx limb five-toothed; petals five, small, valvate, with a small scale at their base, silky outside, yellow; stamens five, filaments short. Leaves alternate, exstipulate, evergreen, quite entire, coriaceous. Branchlets and leaves below silvery, with appressed pubescence. *C. Cotoneaster* has proved quite hardy in a few districts, and would probably be such in many more, if afforded a little protection during winter. Corokias are of easy culture, in moderately good garden soil. They may be propagated by cuttings, planted in sand, under a glass; or by layers, put down in autumn.

C. buddleioides (Buddleia-like). *fl.* similar to those of *C. Cotoneaster*, but borne in short terminal panicles, from six to

Corokia—*continued.*

twenty-flowered. *l.* shortly stalked, narrow lanceolate, or oblong-lanceolate, 2in. to 6in. long, ½in. wide. *h.* 10ft. to 40ft. 1835. An upright shrub or small tree. (R. G. 679.)

C. Cotoneaster (Cotoneaster).* *fl.* yellow, sweet-scented, ¼in. long; petals downy on the outer surface; peduncles solitary, axillary. *l.* alternate or fascicled, ¾in. to 1in. long, orbicular, oblong-ovate or obovate, suddenly contracted in a flat linear petiole; margins recurved. A low, rigid, spreading, much-branched shrub.

COROLLA. The inner whorl of floral envelopes.

COROLLIFLORÆ. A sub-class of Exogens, the vast majority of which are furnished with both calyx and corolla. The petals are occasionally (though rarely) free, sometimes altogether absent; corolla generally irregular, sometimes quite regular; petals generally connate into a two or more lobed corolla; ovary either superior or inferior; stamens epigynous, epipetalous (rarely hypogynous).

CORONA. Literally, a crown; botanically, applied to any appendage that comes between the corolla and the stamens, as the cup of a Daffodil or the rays of a Passion-flower.

CORONILLA (from *corona*, a crown; the flowers are disposed in heads or umbels at the tops of the peduncles). Crown Vetch. ORD. *Leguminosæ.* Ornamental shrubs, or annual and perennial herbs. Peduncles axillary, bearing at their tops umbels of pedicellate flowers. Leaves impari-pinnate. The greenhouse species thrive in a compost of two-thirds loam and one-third turfy peat. Cuttings strike freely if placed in cold frames or a cool house, under a hand glass, in spring, and, when callused, introduced to gentle bottom heat. As soon as rooted, they should be transferred to 60-sized pots, and placed in a frame near the glass, plenty of drainage being given. In order to make them grow bushy, the tops should be freely pinched out; and, as the plants fill the small pots with roots, they should be removed to 48-sized ones, and again returned to the frame. Plenty of air should be given, and, on mild days, the plants may be entirely uncovered; but they need constant attention to watering, as, if allowed to get dry, they become naked at the bottom, which altogether spoils their appearance. Continue to change the pots as required, and, about the first week in September, remove the plants to the greenhouse, where they may remain until the end of May; they should then be again transferred to the open air, in a sheltered position. The hardy species may be propagated by division, in spring; or the young cuttings of some will root in a cold frame. They are also increased by seed, which should be sown as soon as ripe, in a cold frame. The smaller-growing species are admirably adapted for the rockery.

C. coronata (crowned).* *fl.* yellow; umbels many-flowered. July and August. *l.*, leaflets seven to thirteen, obovate, mucronate, glaucous; lower ones approximating the stem; stipules concrete, small, opposite the leaves, bidentate at the apex. *h.* 1ft. to 2ft. South Europe, 1776. Plant suffruticose, erect, or ascending. Greenhouse. SYN. *C. montana.* See Fig. 527.

C. cretica (Cretan). *fl.* white, having the vexillum streaked with red, and the keel dark purple; umbels three to six-flowered. June. *l.*, leaflets eleven to thirteen, cuneated, retuse; the lower ones remote from the stem; stipules small, acute. South Europe, 1731. Plant ascending, annual. Greenhouse. (S. F. G. 713.)

C. Emerus (Emerus). Scorpion Senna. *fl.* yellow; peduncles three to five-flowered. April. *l.*, leaflets five to seven, obovate. *h.* 3ft. to 4ft. South Europe, 1596. Hardy shrub. (B. M. 445.)

C. glauca (glaucous).* *fl.* beautiful yellow, fragrant in the daytime, but scentless at night; umbels seven to eight-flowered. May to September. *l.*, leaflets five to seven, obovate, very retuse, glaucous; lower ones remote from the stem; stipules small, lanceolate. *h.* 2ft. to 4ft. South Europe, 1722. Half-hardy evergreen shrub. An invaluable plant for greenhouse decoration. (B. M. 13.)

C. iberica (Iberian).* *fl.* yellow, large; umbels seven to eight-flowered. July. *l.*, leaflets nine to eleven, obcordate, ciliated; stipules distinct, membranous, orbicular, denticulated. Iberia, 1822. Plant herbaceous, prostrate, hardy. A very charming subject for the rockery. (L. B. C. 789.)

Coronilla—*continued.*

FIG 527. FLOWERING BRANCH OF CORONILLA CORONATA.

C. juncea (rush-like). *fl.* bright yellow; umbels five to seven-flowered. June. *l.*, leaflets three to seven, linear-lanceolate, obtuse, rather fleshy; lower ones remote from the stem. Branches rush-like, terete, almost naked, slender. *h.* 2ft. to 3ft. South Europe, 1656. Half-hardy shrub. (B. R. 820.)

C. minima (smallest).* *fl.* yellow, sweet-scented; umbels seven to eight-flowered. June and July. *l.*, leaflets seven to thirteen, ovate-roundish, obtuse or retuse; lower ones remote from the stem; stipules concrete, small, opposite the leaves, bidentate at the apex. South-west Europe, 1658. Plant suffruticose, procumbent. Half-hardy. (B. M. 2179.)

C. montana (mountain). A synonym of *C. coronata.*

C. stipularis (stipular). A synonym of *C. valentina.*

C. valentina (Valencia). *fl.* deep yellow, very fragrant at night; umbels six to eight-flowered. March to November. *l.*, leaflets seven to nine, obovate, mucronulate, glaucous; lower ones remote from the stem; stipules roundish, large, deciduous. *h.* 3ft. South-west Europe, 1596. Greenhouse shrub. SYN. *C. stipularis.* (B. M. 185.)

C. varia (various).* *fl.* pink and white, or rarely white, at length drooping; umbels sixteen to twenty-flowered. June to November. *l.*, leaflets nine to thirteen, oblong, elliptic, mucronate; lower ones approximating the stem. Europe, 1640. Plant herbaceous, diffuse, flexuous, hardy. (B. M. 258.)

C. viminalis (twiggy). *fl.* pale red, having the vexillum lined lengthwise with red, changing from pale to deep purple, large; umbels six to ten-flowered. May to November. *l.*, leaflets thirteen to twenty-one, obovate, retuse, mucronate; lower ones approximating the stem; stipules ovate. *h.* 2ft. to 4ft. North Africa, 1798. Greenhouse shrub.

CORREA (named after Jose Francesco Correa de Serra, 1750-1823, a learned Portuguese, who published several treatises on plant physiology). ORD. *Rutaceæ.* Greenhouse evergreen shrubs. Pedicels one-flowered, solitary, twin or tern, axillary; petals four, somewhat connivent at the base, or joined into a long tube. Leaves opposite, entire, clothed with starry hairs. This is a most useful genus of decorative plants; they are mainly of free, moderately compact growth, so that, with a little attention in pruning and training the plants whilst young, it is not difficult to form wide uniform-shaped specimens for decorative purposes in the greenhouse or conservatory. If at all well managed, few plants flower more profusely, or continue in blossom a longer time. The advantage they have over many subjects of the same class, when used for conservatory decoration, is considerable, inasmuch as they will bear to be placed, whilst in flower, in nearer proximity to other plants for contrast, and at a distance from the light, without taking much harm; and neither foliage nor wood are subject to attacks of mildew, or likely to suffer from damp. Although Correas may be struck from cuttings as readily as most other hard-wooded plants, they are, for the most part, grafted on *C. alba.* By employing this mode of propagation, the better kinds

Correa—*continued.*

grow more freely, and useful-sized specimens are produced in less time than by means of cuttings. But to insure success, much attention is necessary, and some special requirements, which only those who undertake to raise considerable numbers at one time, can properly give. Therefore, in cases where only a few plants are required, by far the cheapest and best plan is to buy them; selecting clean, healthy, vigorous, young specimens, well furnished with shoots at the base. If procured in spring,

Correa—*continued.*

commences, attention should be paid to training, and in doing this no more stakes should be employed than are actually necessary; the use of these may be obviated altogether by following the far better practice of pinching back the shoots, and a good bushy growth is thereby induced. During their growing period, the plants should be freely encouraged, by keeping them well supplied with water at the roots. They should be syringed overhead in the afternoons of bright days, and the venti-

FIG. 528. FLOWERING BRANCH OF CORREA CARDINALIS.

say, in 5in. or 6in. pots, after having them in possession a little while, they may be shifted into pots 1in. or 2in. more in diameter. Soil for potting should consist of good fibry peat, broken up into pieces sufficiently small to drop between the ball of earth and the sides of the pot. To this should be added a good proportion of silver sand. The house or pit in which the plants are stood, should be kept rather close for two or three weeks after potting. As they become established, more air may be given, and water as required. Before active growth

lators closed before the sun is off the glass, afterwards giving air for the night. After blossoming, the plants should be kept moderately dry for a time; the flowering shoots may then be shortened back, maintaining as much as possible the bases of a well formed and furnished plant. For the winter, Correas should be placed in any light, airy structure with a night temperature of 40deg.

C. alba (white). *fl.* white; petals about ¼in. long. April to July. *l.* ovate, downy beneath, and rather whitish above. *h.* 10ft. Victoria, South Australia, &c., 1793. (B. R. 515.)

Correa—*continued.*

C. cardinalis (cardinal).* *fl.* bright scarlet, tipped with green, pendent, from 1in. to 1¼in. in length. March. *h.* 3ft. A slender-growing but elegant shrub; it requires close pruning. SYN. *C. speciosa.* See Fig. 528. There are several forms of this species.

C. Harrisii (Harris's).* *fl.* bright scarlet. Of medium-growth, with light green apiculated leaves, and fine branching habit. A garden hybrid, of which *C. cardinalis* is one of the parents. (P. M. B. vii. 79.)

C. magnifica (magnificent). *fl.* white, large. A rather strong-growing and free-flowering form.

C. pulchella (beautiful).* *fl.* solitary, pendulous; corolla tubular, bright salmon-colour, with the throat ciliated. April. *l.* ovate, cordate, obtuse, waved, beset with stellate pubescence; adult ones smooth. *h.* 6ft. 1824. A hybrid. (B. R. 1224.)

C. speciosa (showy). A synonym of *C. cardinalis.*

C. ventricosa (inflated). *fl.* bright crimson, tipped with green. A slender-growing twiggy sort, very pretty and distinct.

C. virens (green). *fl.* pendulous; corolla greenish, 1in. or 1¼in. long. November. *l.* ovate-oblong, somewhat cordate, slightly toothed, beset with glandular tomentum. *h.* 3ft. to 8ft. New South Wales, &c., 1800. (B. R. 3.)

In addition to the above, there are many other seedlings and hybrids, among which are: *bicolor, Bidwilli, delicata, hybrida, ochroleuca* and *rosea-superba.*

CORRUGATE. Wrinkled; irregularly crumpled up.

CORSICAN PINE. *See* **Pinus Laricio.**

CORTEX. The bark, or cortical layer.

CORTICAL. Of, or belonging to, the bark.

CORTUSA (named after Jacobo Antonio Cortuso, once Director of the Botanic Garden at Padua; died 1593). Bear's-ear Sanicle. ORD. *Primulaceæ.* The only species of the genus is a very pretty alpine perennial, very like *Primula cortusoides.* It thrives in a compost of moist loam, peat, and sand, with a semi-shaded position, if protected from the wind. Propagated by seed, which must be sown as soon as ripe, in a cold frame; also by carefully dividing the roots. Although, for garden purposes, the two plants are here treated as species, *C. pubens* is a mere form of *C. Matthioli.*

C. Matthioli (Matthioli's). *fl.* purple, umbellate, drooping; corolla funnel-shaped or campanulate, with a short tube and sub-erect limb; scape about 6in. high. Early summer. *l.* petiolate, rotundate, irregularly toothed or lobed. Swiss Alps, 1596. (B. M. 987.)

C. M. grandiflora (large-flowered). *fl.* much larger than in the type, very copious, upon stout peduncles 18in. to 24in. high. *l.* also much larger. Siberia, 1880. This is a very vigorous variety.

C. pubens (downy). *fl.* magenta-purple, drooping, on slender peduncles 4in. to 6in. high. May to June. *l.* stalked, covered with short silky down. Transylvania, 1878. A smaller plant than *C. Matthioli.*

CORYANTHES (from *korys*, a helmet, and *anthos*, a flower; in reference to the shape of the lip). Helmet-flower. ORD. *Orchideæ.* Very extraordinary and ornamental stove epiphytal Orchids. The most remarkable species is *C. macrantha*, and some account of it may be gleaned from the following description, which appeared in the "Botanical Register," over forty years ago: "The plant has the habit of a Stanhopea, and pushes forth from the base of its pseudo-bulbs a pendulous scape, on which two or three flowers are developed; each flower is placed at the end of a long, stiff, cylindrical-furrowed ovary, and, when expanded, measures something more than 6in. from the tip of one sepal to that of the opposite one. The sepals and petals are nearly of the same colour, being of an ochrey-yellow, spotted irregularly with dull purple. The lip is as fleshy and solid in texture as the sepals and petals are delicate; it is seated on a dark purple stalk, nearly 1in. long. This stalk terminates in a hemispherical greenish-purple cup or cap, and the latter, contracting at its front edge, extends forward into a sort of second stalk of a very vivid blood-colour, the sides of which are thinner than the centre, turned back, and marked with four or five very deep, solid, sharp-edged plaits These edges again expand and form a second cup, less lobed than the first, thinning away very much to the edges, of a

Coryanthes—*continued.*

broad conical figure, with a diameter of at least 2in. at the orifice; this second cup is of an ochrey-yellow, streaked and spotted with pale crimson, and seems intended to catch a watery secretion, which drips into it from two succulent horns, taking their origin in the base of the column, and hanging over the centre of the cup." For culture, *see* **Stanhopea.**

C. macrantha (large-flowered).* *fl.* lasting but three or four days in bloom. May, June, and July. Caraccas. (B. R. 22, 1841.) *See also* description given above.

C. maculata (spotted). *fl.* pale ochraceous-yellow, spotted with purple, lasting but three days in beauty. Summer. Demerara, 1829. (B. M. 3102.)

C. speciosa (showy). *fl.* pale yellow, ephemeral in consistency. April. Brazil, 1826. SYN. *Gongora speciosa.* (B. M. 2755.)

FIG. 529. FLOWERS OF CORYDALIS BRACTEATA.

CORYDALIS (the old Greek name for the Fumitory; from *korydalos*, a lark; the spur of the flower resembles the spur of a lark). ORD. *Fumariaceæ.* A genus of very pretty, smooth, usually glaucous herbs. Racemes terminal or opposite the leaves, with a bract under each pedicel; petals four, the two outer larger, one or both gibbous or spurred, often coherent, in two usually very dissimilar pairs. Leaves much divided, alternate, sub-opposite at the tips. Roots fusiform, tuberous, or fibrous. There are about seventy species. They are well adapted for borders and rockwork; and some of them will thrive well under trees, if the ground be not too dry. The method of culture is exceedingly simple. They are increased by dividing the plants directly after flowering, or by seed; the bulbous-

Corydalis—*continued.*

rooted species by offsets; and the annuals by seed, which may be sown in spring where they are intended to remain.

C. aurea (golden). *fl.* golden-yellow, ½in. long; spur blunt, shorter than pedicel. May to July. *l.* glaucous, bipinnate; pinnæ pinnatifid and cut; lobes oblong-linear. Stem diffuse, branched. *h.* 6in. United States, 1683. Annual or biennial. (B. R. 66.)

C. bracteata (bracteate).* *fl.* sulphur-yellow, horizontal, 1in. long; spur longer than the pedicel. May, June. *l.* two, biternate; segments cleft into linear lobes. Stem simple, erect, scaly near the base. *h.* 9in. Siberia, 1823. Hardy perennial. See Fig. 529.

C. bulbosa (bulbous). A synonym of *C. solida.*

C. cava (hollow-rooted).* *fl.* purple, horizontal; bracts ovate, entire. February to May. *l.* two, biternate; segments cuneated, cleft. Stem simple, not scaly. *h.* 6in. Europe, 1596. Perennial. SYN. *C. tuberosa.* (B. M. 232.)

C. c. albiflora (white-flowered).* Similar in every respect, except the pretty white flowers.

C. claviculata (tendrilled). *fl.* straw-coloured; spur short, and blunt. June. *l.* bipinnate; petioles tendrilled; segments oval, and entire. Stem branched, diffuse, scandent. *h.* 1ft. to 4ft. West Europe (Britain), from Denmark to Spain. Annual. (Sy. En. B. 70.)

C. fungosa. *See* **Adlumia cirrhosa.**

C. glauca (glaucous). *fl.* red and yellow; spur blunt, one-half or three times shorter than the corolla. July. *l.* bipinnate, glaucous; pinnæ somewhat pinnatifid; segments stalked, cuneated, trifid. Stem erect, branched. *h.* 1ft. to 1½ft. Canada, 1683. Annual. (B. M. 179.)

C. Kolpakowskiana (Kolpakowsky's).* *fl.* pink or purple, with long spurs; bracts as long as the pedicels. *l.* glabrous, deeply divided. *h.* 6in. Turkestan, 1879. Perennial. (R. G. 948.)

C. Ledebouriana (Ledebour's). *fl.* pinkish, with a dark spot at the apex of the sepals. *l.* ternately divided, glaucous. *h.* 6in. Altai, 1879. Perennial. (R. G. 981.)

C. lutea (yellow).* *fl.* yellow; bracts linear-subulate, three times shorter than the pedicel. May. *l.* biternate; segments obovate, cuneated, trifid. Stem branched, diffuse. *h.* 1ft. Europe, naturalised in Britain (on old walls, &c.). Perennial.

C. Marschalliana (Marschall's).* *fl.* sulphur-coloured; spur straight or hardly incurved, blunt; bracts ovate. April. *l.* two, situated above the middle of the stem, biternate; lobes oval, entire or bifid. *h.* 9in. Tauria, 1823. Perennial.

FIG. 530. CORYDALIS NOBILIS, showing Habit, and Side View of Single Flower.

C. nobilis (noble-flowered).* *fl.* pale yellow, tipped with green; spur long, blunt and incurved at the point; bracts acute, entire or cut. May. *l.* bipinnate; segments cuneated, cut at the top. Stem simple, erect, not scaly. *h.* 9in. Siberia, 1783. A beautiful perennial plant. See Fig. 530. (G. C. n. s., xix. 725.)

C. Semenowii (Semenow's).* *fl.* deep yellow; spur short, saccate, bent downwards. April, May. *l.* glaucous, green, bipinnatisect; pinnules oblong ovate; lobes acuminate. Stem erect, simple, leafy. *h.* 1ft. to 1½ft. Turkestan. See Fig. 531.

Corydalis—*continued.*

FIG. 531. CORYDALIS SEMENOWII, showing Inflorescence and Leafy Stem.

C. sibirica (Siberian). *fl.* yellow, usually recurved; bracts linear, nearly as long as the pedicels. June. *l.* somewhat glaucous, bipinnate; segments cut into oblong-linear lobes. Stem nearly erect, branched. *h.* 1ft. to 3ft. Siberia, 1810. Perennial.

FIG. 532. CORYDALIS SOLIDA, showing Habit, and Side View of Single Flower.

C. solida (solid).* *fl.* purplish, large. April, May. *l.* three or four, stalked, biternate; segments cuneated or oblong, and, as well as the bracts, cut at the top. Stem simple, erect, scaly under the lower leaf. *h.* 6in. Europe, naturalised in Britain (in woods and rather humid places). Perennial. SYN. *C. bulbosa.* See Fig. 532.

C. tuberosa (tuberous). A synonym of *C. cava.*

CORYLACEÆ. This order (the principal genera of which are *Carpinus, Castanea, Corylus, Fagus,* and *Quercus*), founded by Lindley, is now included under *Cupuliferæ.*

CORYLOPSIS (from *Korylos,* the Hazel-tree, and *opsis,* like; Nut-like). ORD. *Hamamelideæ.* Very ornamental and interesting hardy deciduous shrubs, in habit, leaves, and inflorescence, resembling Hazels. Flowers appearing before the leaves, in pendulous racemes, each flower nearly sessile, with a large sheathing bract; petals and stamens five; perigynous scales five, alternating with the stamens, or ten to fifteen irregularly placed. Capsule woody, with narrowly ellipsoid shining black seeds. All

Corylopsis—*continued.*

the species are mentioned below. For culture, *see* **Hamamelis**.

C. himalayana (Himalayan). *fl.* yellow, white; racemes many-flowered. March. *l.* round, ovate, or acute, often cordate at the base, plicate, glabrous above, silky or tomentose beneath. *h.* 6ft. Khasia Mountains and Bhotan. (B. M. 6779.)

C. multiflora (many-flowered), from the tea districts of Tokien, in China, has not yet been introduced. It has few-nerved, rather rigid leaves, glaucous beneath, and long dense-flowered racemes.

C. pauciflora (few-flowered) resembles *C. spicata* in colour, scent, habit, &c.; but the leaves are smaller, the racemes contain fewer (two to four) flowers, and the plant is dwarfer. Japan.

FIG. 533. FLOWERS OF CORYLOPSIS SPICATA.

C. spicata (spicate).* *fl.* pale yellow, with a fragrant Cowslip-like odour; issuing singly from the axil of a greenish-yellow bract; racemes eight to twelve-flowered, 2in. to 3in. long, drooping. February. *l.* long-stalked, acutely cordate, strongly feather-veined, mucronately serrated, somewhat hoary beneath. *h.* 3ft. to 4ft. Japan, 1864. See Fig. 533.

CORYLUS (from *korys*, a hood, or helmet; in reference to the calyx covering the nut). Hazel; Cob-nut. ORD. *Corylaceæ*. Low trees and large shrubs, deciduous. Male flowers whitish, in cylindrical catkins; bracts sessile, imbricate. Female flowers red, in a bud-like catkin, which is developed into a branchlet. Leaves simple, alternate, exstipulate.

CULTIVATION. The first object in successful Nut culture is to keep down suckers, unless required for propagation. The more tree-like the plants, the more productive they are; hence the importance of removing all latent buds from the base and stems of seedlings or plants of any description. The height of clear stem may vary from 1ft. to 6ft. The trees are classified, according to the height of their stems, as standards, half-standards, and dwarf standards; the natural or many-stemmed bush

Corylus—*continued.*

being generally termed a Nut or Filbert stool. As the crop may be considered a permanent one, the soil should be carefully prepared, by trenching and manuring. A good deep loam, in a rather dry, sunny position, suits Hazels best, as it encourages the production of short fruit-bearing wood. During severe winters, the male blossoms are sometimes injured by frost. In other seasons, and in certain localities, the cultivated Filbert produces few catkins. In either case, these should be collected from wild Hazel-nuts, when obtainable, and suspended among the better varieties. When planting, choose well-established suckers, or layers, four or more years old. Firmly stake them as soon as inserted, and place a spadeful or two of manure on the soil, over the roots. The intermediate spaces may be cropped with potatoes, or other dwarf vegetables, for a year or two.

PROPAGATION may be effected by seed, by suckers, or by layers. Grafting and budding are each practicable, and are adopted when growing tall standards or scarce varieties.

Seed. For forming tall standards, seedlings of the Constantinople Nut (*C. Colurna*), one of the strongest-growing of all the Hazels, should be used. These should be allowed to run up to a height of 8ft. or 10ft., and then be grafted with any desired variety. The seed of all Nuts may be sown as soon as gathered, or stored in sand till the following February or March. They should be placed thinly in rows, and covered with at least 2in. of soil. Most of the Nuts will have started before midsummer. In October or November of the second year, plant them in lines, 2ft. to 3ft. apart, and from 6in. to 15in. from each other in the rows, according to their strength. The seed of good varieties seldom produce others equal to their parents in quality; consequently, this plan of propagation should not be practised with them.

Suckers. For market and garden purposes, all superior varieties should be propagated by suckers or layers. The Filbert, if left to its own habit, produces suckers in abundance. Good cultivators remove all these; but the propagator encourages their growth, as each one forms a plant. If the soil is poor, the stools should be manured. Sometimes it may be well to take them up bodily, in the autumn, to obtain good roots to each sucker; but, generally, the latter may be removed without disturbing the stools. Another crop may be obtained the following autumn. The small plants should be put out like the two-year-old seedlings, when they will soon grow into useful sizes. The large ones, some of which may be 2ft. to 3ft. high, are best planted out at wider distances, or in their fruiting quarters, at once.

Layers. Stools kept for layering must be allowed to make more growth than those used for suckers only, as a certain length and flexibility of shoot are essential to successful propagation by this method. Free growth must be encouraged for a year or two, and, any suitable time in winter, the shoots should be bent to the ground, pegged firmly, and covered to a depth of 3in. with earth. They will be well rooted by the following autumn, and may then be removed and planted out permanently.

PRUNING, as distinct from mere heading back, is an important feature in Filbert culture. Even the time to prune becomes a matter of vital moment; for, by performing this operation too early, a great many of the male catkins may be cut away. March, or even April, when the female blossoms are fully open, is the best time. The plants bear on the lateral growth of the previous summer, and most plentifully on moderate-sized wood. Hence, the young shoots should be stopped to insure such growth, and as much as possible of the old wood that has already borne fruit, removed annually. The shape to which Filberts are often formally trained for cultivation in gardens is that of a cup or vase. The stem is kept quite clear for 1ft. or more at the bottom, and the head is formed by not

Corylus—*continued.*

less than six branches trained in the shape alluded to. These, when old enough, produce the lateral growths for fruit production, and the young free growths at the top are generally loaded with the male catkins in spring.

PLANTING is best performed in October. The proper distance apart is from 10ft. to 20ft. each way. Some of the fertile dwarf varieties may be inserted closer. On rich soils, Filberts grow much wider and higher, many of the stronger ones reaching a height of 20ft., with a spread of branches as much or more in diameter. Such vigorous growth is not to be encouraged, as it does not conduce to free fruitfulness.

GATHERING AND STORING. Neither Filberts nor Nuts should be gathered till quite ripe, which is easily known by the brown colour of the Nut, the tint of the husk, and the ease with which the Nuts leave the latter. Filberts will not keep well in the husks if gathered before they are ripe. Nor must they be left until so ripe as to allow the Nuts to leave the husks when the trees are slightly agitated. In order to prevent the husks becoming mouldy when stored, they should first be well dried. Some cultivators expose them to sulphur fumes as a preventative; others store Nuts in casks or jars, and sprinkle them over with salt, for the same purpose, before covering up. They must always be kept in a cool, dry place after being packed.

DISTINCTIVE CHARACTER OF NUTS AND FILBERTS. This is so often a bewildering question to amateurs, that it may be well to explain fully. The difference lies solely in the length of the husks. Nuts with husks as long as, or longer than, the Nuts themselves, are called Filberts. All that have husks shorter than the fruit are designated Nuts. Some varieties, if this rule were strictly applied, could hardly be referred to either. Again, Filberts served without their husks are called Nuts.

INSECTS, &c. The Nut crop is sometimes much injured by the Nut Weevil (*Balaninus nucum*), which pierces and inserts a single egg within the shell of the tender Nut, in spring. This, by the time the Nut is nearly matured, forms into a small grub, and, eating its way out, falls to, and buries itself in, the ground, where it becomes a pupa, and emerges as a perfect insect the following season. The only preventative is to gather any perforated nuts that may be shaken off early in the season, and burn them. The Squirrel and Dormouse are also well-known as being most destructive animals to the Nut crop, as, apart from what are eaten by them at the time, as many as possible are stored for a future supply.

C. americana (American). American Hazel. *fl.*, males greyish; females crimson. April. Nut brown, ripe in October; involucre of the fruit roundish, campanulate, longer than the nut; limb spreading, dentately serrated. *l.* roundish, cordate, acuminate. *h.* 4ft. to 8ft. Canada to Florida, in low, shady woods, 1798. Shrub.

C. Avellana (Avellino).* Common Hazel or Filbert; Wood Nut. *fl.*, males greyish; females crimson. April. Nut brown, ripe in October; involucre of the fruit campanulate, rather spreading, torn at the margin. *l.* roundish, cordate, pointed; stipules oblong, obtuse. *h.* 20ft. and upwards. Europe (Britain), North Africa, and temperate Asia.

C. Colurna (Colurna).* Constantinople Hazel. *fl.* as in the common Hazel, but longer and larger. Nut small; involucre of the fruit double, the exterior many-partite, the inner three-partite; divisions palmate. *l.* roundish-ovate, cordate; stipules lanceolate, acuminate. *h.* 60ft. Asia Minor, 1665.

C. heterophylla (variable-leaved). *l.* cordate at the base, broadly obovate, irregularly toothed, five to seven-lobed, the lateral lobes often as long as the terminal one. Nut globose, scarcely inclosed by the large irregularly-cut bracts with spreading lobes. Eastern Asia, 1880. A very distinct shrub or small tree.

C. rostrata (beaked). Flowers and fruit as in the common Hazel. Involucre of the fruit tubular, campanulate, larger than the nut. bipartite; divisions inciso-dentate. *l.* ovate, oblong, acuminate; stipules linear-lanceolate. *h.* 4ft. to 5ft. Canada to Carolina, on mountains, 1745. A bushy shrub. This species closely resembles the common European Hazel; but is distinguished from it by its fruit being covered with the calyx, which is prolonged in the form of a long, hairy beak, whence the specific name.

Corylus—*continued.*

C. tubulosa (tubular).* Lambert's Filbert. Nut, large, oblong; shell thick and strong, the kernel being covered with a red skin; husk long, rather smooth, serrated at the edges, longer than the nut. A fine, strong-growing, free-fruiting variety. It is also known as Filbert Cob, Great Cob, Kentish Cob, Large Bond Nut, &c.

Of *C. Avellana* and *C. tubulosa* there are numerous varieties, the most important of which are enumerated below:

Alba.* White Filbert. This is one of the finest varieties in cultivation. From the peculiar structure of the husk, which contracts, rather than opens, at the outer edge, this Filbert can be kept longer in its cover than most others. This is also known as Avelinier Blanche, Wrotham Park, &c.

Cosford.* Miss Young's, Thin-shelled. Nut oblong, of excellent quality; husk hirsute, deeply laciniated, about as long as the nut. This is valuable from the thinness of its shell, as no nut-crackers are needed in order to get at its contents.

Crispa.* Cape-nut, Frizzled Filbert. Nuts thin, somewhat flattened, late; husks richly and curiously frizzled throughout, open wide at the mouth, and hanging about as long again as the nut. This is an enormous cropper, producing its fruit in clusters.

Downton Large Square.* Nut very large; shell thick and well-filled; husk smooth, shorter than the nut. A peculiarly-formed semi-square nut, of the highest quality.

Grandis.* Round Cob-nut. Nut large, short, slightly compressed, very thick and hard; husk shorter than the fruit, much frizzled and hairy. This is supposed to be the true Barcelona Nut of commerce, and is one of the finest grown. The quality is good, and is at its highest when the nut is first gathered. It has numerous synonyms, including the following: Barcelona, Downton, Dwarf Prolific, Great Cob, Prolific, and Round Cob.

Purple-leaved Filbert.* *l.* large and fine, and as deeply coloured as the finer varieties of Purple Beech. Nuts and husks of the same colour, which they retain; husks longer than the nuts, and hairy. This is a very ornamental and distinct plant for shrubbery borders, apart from its value in producing a nut of excellent quality.

Red Filbert. Avelinier Rouge, Red Hazel. Nut medium size, ovate; shell thick; husk long, hispid. A good free-bearing variety, of fine quality.

Spanish. Nut very large, oblong; shell thick; husk smooth, longer than the fruit. A very large variety, sometimes confounded with the Round Cob-nut and its synonyms.

CORYMB. A raceme, the pedicels of which are gradually shorter as they approach the summit, so that the result is a flat-headed inflorescence, as in Candytuft.

CORYNOCARPUS (from *koryne*, a club, and *karpos*, a fruit; in reference to the shape of the fruit). ORD. *Anacardiaceæ*. A greenhouse evergreen shrub. For culture, *see* **Ardisia.**

C. lævigatus (smooth). *fl.* white, disposed in large, terminal panicles. *fr.* plum-like; when fully ripe, the drupaceous coat is eaten by natives, as are also the kernels after the poisonous property they are said to possess is dissipated by steaming or maceration in salt water. *l.* alternate, stalked, obovate, wedge-shaped, sub-emarginate, quite entire, glabrous. *h.* 20ft. New Zealand, 1823. (B. M. 4379.)

CORYNOPHALLUS (from *koryne*, a club, and *phallos*, a mace; alluding to the club-shaped appendix to the spadix). ORD. *Aroideæ*. A genus now included under *Amorphophallus*. For culture, &c., *see* **Caladium.**

C. Afzelii (Afzelius'). *fl.*, spathe tubular below, expanding above into a broadly ovate-acute limb, marbled outside, purple within, and marked with white stripes; spadix dilated above into a club-shaped mass; produced at a different time from the leaves. *l.* on slender petioles 1ft. to 2ft. high; the limb is divided into three main divisions, each of which is again split up into three, rarely two, subdivisions, these latter are in their turn pinnatisect; ultimate segments varying in length and breadth, but always decurrent at the base, and sharply pointed at the apex. Tropical Africa, 1873. (G. C. 1872, 1619.)

C. A. elegans (elegant).* *l.*, segments very narrow, and more drooping than in either of the other varieties; leafstalk green, self-coloured.

C. A. latifolia (broad-leaved). *l.*, segments broader, and not so much subdivided as in the others; each main subdivision being divided into two segments, and these again bear two or three ultimate segments only.

C. A. spectabilis (showy).* Lower part of the stem puce-coloured, and marked with dark linear oblong spots.

CORYNOSTYLIS (from *koryne*, a club, and *stylos*, a column; alluding to the club-shaped style). SYN. *Calyptrion*. ORD. *Violarieæ*. Elegant climbing stove shrubs. Flowers white, large; petals five, the lower one large,

Corynostylis—*continued.*

drawn out behind into a large hollow pouch, which is compressed on the sides, and constricted in the middle, twisted, many-nerved. Leaves alternate. Increased by seeds; or by cuttings of the young wood, placed in sand, in bottom heat, and under a hand glass.

C. Aubletii (Aublet's). *fl.* white, large, in fascicled racemes. *l.* oblong-ovate, acuminated, serrated. Stem striated, covered with white spots. Guiana, 1823. SYN. *C. Hybanthus.*

C. A. albiflora (white-flowered). *fl.* white, horn or trumpet-shaped, about 2in. long; pedicels long, thread-like. *l.* ovate, acuminate. Para, 1870. Taken in profile, the flowers present the appearance of a long-spurred Tropæolum, while on the front view they bear a resemblance to those of a gigantic Violet.

C. Hybanthus (bent-flowered). A synonym of *C. Aubletii.*

CORYPHA (from *koryphe*, the summit; in reference to the leaves growing in tufts on the top of the trunk). Fan Palm. SYN. *Taliera.* ORD. *Palmæ.* A small genus of stove Palms, with large fan-shaped leaves. Trunks ringed or channelled, unarmed, generally very straight, terminated by a crown of leaves, with prickly petioles. They are of somewhat slow growth, and are best cultivated in a compost of two parts loam, one of peat, and one of sand. Thorough drainage and a liberal supply of water are essentials to success. *See also* **Chamærops, Livistona,** and **Sabal.**

C. australis (Southern). Synonymous with *Livistona australis.*

C. Gebanga (Gebang). *l.* fan-shaped, glaucous, divided fully half their length into narrow segments; petioles very stout. *h.* 60ft. Java, 1847. The leaves of this species are largely used by the natives for thatching, making baskets, &c.

C. umbraculifera (umbrella-bearing).* *l.* very large, fan-shaped, plaited, forming a complete circle about 12ft. in diameter; petioles about 6ft. long; edges armed with small brown teeth-like spines. *h.* 100ft. South India and Ceylon, 1742. The famous Talipot Palm, whose magnificent leaves are used in making fans, umbrellas, and many other things.

Other species are: *elata, macropoda, sylvestris,* and *Taliera.*

CORYSANTHES (from *korys*, a helmet, and *anthos*, a flower; flowers helmet-shaped). SYN. *Calcearia.* ORD. *Orchideæ.* A genus of small, but very pretty, greenhouse terrestrial Orchids, allied to *Pterostylis*, and requiring a compost of light sandy loam. There are about fifteen species, distributed throughout Australia, New Zealand, and the islands of the Malayan Archipelago, but they are rarely seen in cultivation.

C. limbata (edged). *fl.* purple, white. Autumn. *l.* ovate, cordate, bright green, with reticulated white veins. *h.* 2in. to 3in. Java, 1863. (B. M. 5357.)

C. picta (painted).* *fl.* with a very curious aspect, nearly sessile, bilabiate; the upper and hinder portion fornicato-adscendent, richly stained with deep purple and yellow; the lower lip divided into four long subulate segments, and a similar body, described as a bract, seated at the base of the short ovary. *l.* solitary, cordate, ovate, reticulated. *h.* 3in. or 4in. Java, 1867.

COSCINIUM (from *koskinon*, a little sieve; alluding to the seed being pierced). SYN. *Pereira.* ORD. *Menispermaceæ.* A stove climbing shrub. It requires plenty of room to grow in, or it will not flower well. A compost of light loam and peat suits it well. Cuttings of young growth, taken during summer, will root under a hand glass.

C. fenestratum (window-wood). False Calumba. *fl.* greenish; peduncles umbellulate, several from the same bud. November. *l.* alternate, cordate, entire, five to seven-nerved, smooth and shining above, very hoary underneath. Ceylon, 1820. SYN. *Pereira medica.* (B. M. 4658.)

COSMANTHUS (from *kosmos*, beautiful, and *anthos*, a flower). A small genus of annual herbs, belonging to the natural order *Hydrophyllaceæ*, but now usually included under **Phacelia** (which *see*).

COSMELIA (from *kosmeo*, to adorn; in allusion to the beauty of the flowers). ORD. *Epacrideæ.* An erect much-branched greenhouse evergreen shrub. It requires peat, with a large proportion of silver sand; in fact, the same treatment as **Epacris** (which *see*). Cuttings may be obtained during the summer months.

Cosmelia—*continued.*

C. rubra (red). *fl.*, corolla deep red, tubular, solitary, drooping, terminating the short lateral branches. April and May. *l.* with cucullate bases, half-sheathing. *h.* 3ft. to 6ft. South-west Australia, 1826. (B. R. 1822.)

COSMIBUENA (from Cosimi Buena, a Spanish physician, who wrote a Natural History of Peru). ORD. *Rubiaceæ.* A small genus of handsome stove plants, allied to *Bouvardia, Cinchona, Luculia,* &c. Calyx tube oblong or turbinate; limb tubular or bell-shaped, five to six-toothed; corolla salver-shaped, or funnel-shaped, with an elongated tube, and a five to six-lobed spreading limb. They are of easy culture in a compost of loam, leaf mould, and sand. Propagated by seeds; or by cuttings of ripe wood, placed in sand, under a hand glass, in bottom heat.

C. obtusifolia latifolia (broad obtuse-leaved).* *fl.* white, very fragrant, disposed in terminal cymes; peduncles stout, ½in. to ¾in. long; tube 3in. long, somewhat dilated for ½in. at the throat. *l.* opposite, petioled, 3in. to 6in. long, elliptic or rarely more or less ovate or obovate. *h.* 20ft. Columbia, 1876. SYN. *Cascarilla grandifolia.* (B. M. 6239.)

COSMIDIUM. *See* **Thelesperma.**

COSMOS (from *kosmos*, beautiful; in reference to the flowers). ORD. *Compositæ.* Annuals or perennials. Flower-heads solitary; receptacle furnished with linear acute, coloured bracteoles, equalling or excelling the florets. Leaves pinnate. All are readily increased from seed, which may be sown in gentle heat, in early spring. When large enough, the seedlings should be pricked off, and finally planted out in May, similar to other annuals. The perennials require to be protected during winter, and may be propagated like Dahlias, in spring.

FIG. 534. FLOWERING BRANCH OF COSMOS BIPINNATUS.

C. bipinnatus (bipinnate). *fl.-heads* rose or purple, with a yellow disk; peduncles axillary and terminal, leafy, rather short. Late summer. *h.* 2ft. Mexico, 1799. Annual. See Fig. 534.

C. scabiosoides (Scabious-like). *fl.* scarlet; outer scales of involucre shorter than the leaves. October. *l.* pinnate-parted, hispid beneath, with two pairs of lanceolate-oblong, sub-serrated leaflets, the terminal one the largest. Stem downy. *h.* 3ft. to 4ft. Mexico, 1834. This species is a half-hardy perennial, with tuberous roots, like the common Dahlia. (B. R. 1838, 15.)

Cosmos—*continued.*

C. tenuifolius (slender-leaved). *fl-heads* rich purple; outer bracts of involucre less acuminate than those of *C. bipinnatus*. Autumn. *l.* very finely cut, almost Fennel-like. *h.* 1ft. to 2ft. Mexico. Annual. (B. R. 2007.)

COSSIGNIA (named after M. Cossigny, a French naturalist, once resident at Pondicherry, who presented Commerson with an herbarium of the plants of Coromandel). ORD. *Sapindaceæ*. An ornamental stove shrub, with impari-pinnate leaves. A compost of two parts loam, and one each of peat and sand, suits the Cossignia. Thorough drainage, and a liberal supply of water, are essential points in its culture. "This plant may be increased by cuttings of the ripe wood, inserted in sand, and plunged in a strong moist heat; we have not, however, found them root very freely" (B. S. Williams).

C. borbonica (Bourbon). A synonym of *C. pinnata*.

C. pinnata (pinnate).* *fl.* white, panicled. *l.* impari-pinnate, with from three to five oblong, entire leaflets, somewhat scabrous above, dark green, with bright orange-yellow veins beneath. *h.* 10ft. to 20ft. Mauritius, 1811. SYN. *C. borbonica*.

COSSUS. *See* **Goat Moth.**

COSTA. The midrib of a leaf; that part which is a direct extension of the petiole, whence the veins arise.

COSTÆ. Any longitudinal elevations.

COSTATE. Ribbed.

COSTMARY, or **ALECOST** (*Tanacetum Balsamita*). A hardy perennial, native of the Orient, but now become naturalised in many parts of South Europe. The leaves were formerly put into ale, and are now sometimes used in salads. The plant has a peculiar odour, and is not much used in this country. Propagation is effected by division of the roots, in early spring or in autumn, planting 2ft. apart, in a dry, warm situation, where they may remain for several years.

COSTUS (an ancient name, adopted from Pliny). SYN. *Tsiana*. ORD. *Scitamineæ*. A genus of about twenty-five species of stove perennial herbs, few of which are in cultivation. Flowers in spikes, with overlapping bracts; tube of corolla funnel-shaped; the outer segments of the limb equal; the innermost, or middle segment—the lip or labellum—large, bell-shaped. Leaves fleshy. Roots tuberous. The species are of simple culture in a compost of sandy loam, to which a little peat is added. Propagated easily by dividing the roots.

C. Afer (Afer). *fl.* white, tinged with yellow. Summer. *l.* ovate-elliptic, narrowly acuminate. *h.* 2ft. Sierra Leone, 1821. (B. M. 4979.)

C. igneus (fiery).* *fl.* bright orange-scarlet. *l.* elliptic, acuminate, glabrous. *h.* 1ft. to 3ft. Bahia, 1882. (I. H. n. s. 511.)

C. Malortieanus (Malortie's).* *fl.* golden-yellow, marked with irregular orange-red bands. *l.* large, obovate, acute, shortly stalked. *h.* 1ft. to 3ft. Costa Rica, 1860. (B. M. 5894.)

C. speciosus (showy). *fl.* white. August. *l.* silky beneath. *h.* 3ft. India, 1799. (P. M. B. 4, 245.)

C. spiralis (spiral). *fl.* scarlet. November. *l.* long-elliptic, thick, shining. *h.* 4ft. Caraccas.

COTONEASTER (from *Cotoneum*, the Quince-tree, and *aster*, like; similar to the Quince-tree). Rose Box. ORD. *Rosaceæ*. A genus of hardy shrubs or small trees. Flowers white or pink, small, solitary, or in axillary or terminal cymes, sometimes polygamous; petals five, imbricate in bud; stamens twenty, inserted at the mouth of the calyx. Leaves simple, coriaceous, quite entire, generally woolly beneath. There are about fifteen species, all of which are excellent for shrubberies and gardens; several are very ornamental when trained against a wall, where their intense scarlet fruits remain very conspicuous throughout the winter. Cotoneasters are of easy cultivation in ordinary garden soil. They may be readily propagated by seed, which should be sown in spring; by cuttings, in autumn; by layers, at the same time; or by grafting on *C. vulgaris* or the common Quince, or on the Hawthorn.

C. acuminata (taper-pointed). *fl.* pink; cymes one to five-flowered, very short. April and May. *fr.* turbinate, scarlet. *l.* ovate, acuminated, or acute, at length glabrous beneath.

Cotoneaster—*continued.*

h. sometimes 14ft. Nepaul, 1820. Deciduous. SYN. *Mespilus acuminata*. (L. B. C. 919.)

C. bacillaris (staff-like). *fl.*, cymes short, many-flowered, puberulous. *l.* oblong or obovate, or oblong-lanceolate, woolly or glabrescent beneath, acute or obtuse, narrowed into the petiole. Nepaul. Hardy deciduous. Much used for walking sticks, hence the specific name.

C. buxifolia (Box-leaved).* *fl.* white, rather large; cymes two to six-flowered, woolly, short. April and May. *l.* elliptic-acute or apiculate-ovate, woolly beneath, evergreen. *h.* 3ft. to 4ft. Nilghiri, &c., 1824.

C. frigida (frigid).* *fl.* white; cymes woolly, very many-flowered. April and May. *l.* oblong or oblong-lanceolate, acute, narrowed to the base, tomentose beneath. *h.* 10ft. Nepaul, 1824. A sub-evergreen shrub or tree. (B. R. 1229.)

C. laxiflora (loose-flowered). *fl.* pink; cymes panicled, pilose; calyces quite smooth. April. *l.* oblong, obtuse at both ends, woolly beneath. *h.* 3ft. to 5ft. 1826. Deciduous. (B. R. 1305.)

C. microphylla (small-leaved).* *fl.* white, usually solitary. April and May. *l.* ovate or obovate, acute, retuse or obtuse, glossy above, pubescent or tomentose beneath. *h.* 3ft. to 4ft. Nepaul, 1824. Evergreen. (B. R. 1114.) "Grafted standard high on the thorn, or any of its congeners," says Loudon, "this shrub forms a singular and beautiful evergreen drooping tree; or it will cover a naked wall nearly as rapidly as Ivy; and it possesses a decided advantage over that plant, in its shoots, which may be prevented from extending many inches from the face of the wall, and, consequently, being not likely to injure the plants growing near it."

C. multiflora (many-flowered). *fl.* white; cymes three to ten-flowered, on short or long, nearly glabrous peduncles. May. *l.* ovate elliptic, or obovate-acute, obtuse or rounded at the tip, glabrous above, glaucous and glabrous or faintly silky beneath. *h.* 4ft. Kashmir, &c., 1837. Deciduous.

C. nummularia (Nummularia-like).* *fl.* white; cymes woolly, very short, two to five-flowered. April and May. *fr.* small, globose, black. *l.* orbicular, or obovate-obtuse, apiculate, white or densely silky-woolly beneath. *h.* 10ft. to 15ft. Kashmir, Western Thibet, &c., 1824. An elegant and distinct sub-evergreen species.

C. rotundifolia (round-leaved). *fl.* white, solitary, sub-sessile. April and May. *l.* orbicular, or orbiculate-obovate, mucronate, glabrous or sparsely hairy above and beneath; pilose beneath. *h.* 3ft. to 4ft. Nepaul, 1825. Evergreen. (Ref. B. 54.)

C. Simonsii (Simons's).* *fl.* solitary or twin, nearly sessile, on short lateral branches. April. *l.* nearly 1in. long, rhombic-orbicular acuminate, glabrous above, sparsely silky beneath. Origin unknown. Evergreen in mild winters. Probably one of the best. (Ref. B. 55.)

C. thymifolia (Thyme-leaved).* *fl.* pinkish, small. April. *l.* small, oblong-ovate, dark shining green above, silvery-white beneath. Temperate Himalayas, 1852. A very pretty evergreen, less than 1ft. high, with congested, crowded, often decurved branches, and scarlet fruits. (Ref. B. 50.)

C. t. congesta (congested). *fl.* white. *l.* palish green, obovate-oblong, thinly glaucous silky beneath. Western Himalayas, 1868. A neat evergreen, forming a compact rounded mass, with rigid, recurved, remarkably congested branches, and globose scarlet fruits. (Ref. B. 51.)

C. vulgaris (common).* *fl.* reddish; cymes lateral, few-flowered. May and June. *fr.* globose, shining red. *l.* broadly elliptic oblong, rounded or acute at the tip, densely pubescent beneath. *h.* 3ft. to 5ft. Europe (Britain), North and West Asia, Himalayas. Deciduous. SYN. *Mespilus Cotoneaster*. (Sy. En. B. 477.) There is also a black-fruited form of this species.

COTTON. *See* **Gossypium.**

COTTON GRASS. *See* **Eriophorum.**

COTTON THISTLE. *See* **Onopordon.**

COTTON-TREE. *See* **Plagianthus.**

COTTON-TREE, SILK. *See* **Bombax.**

COTYLEDON (from *kotyle*, a cavity; in allusion to the cup-like leaves of some of the species). Navelwort. ORD. *Crassulaceæ*. Under this one genus are now included *Echeveria*, *Pachyphytum*, *Pistorinia*, and *Umbilicus*. To render the matter clearer, the typical characters of these four sections are given below. The differences are merely botanical; and the culture of the groups is identical. Greenhouse evergreens, except where otherwise stated.

Cotyledon. Calyx five-parted; corolla gamopetalous, with a five-lobed, spreadingly reflexed limb; stamens ten, adnate at the base to the tube of the corolla; scales oval; carpels five, each drawn out into a subulate style. Fleshy shrubs, from the Cape of Good Hope.

Echeveria (including *Pachyphytum*). Calyx five-parted; sepals often foliaceous, erect; corolla urceolate, five-lobed

Cotyledon—*continued.*

or five-partite; lobes often longer than the tube; stamens ten, united to the petals at the base; scales five; carpels five, each ending in a subulate style. Fleshy shrubs or herbs, mostly from Mexico, one from Peru, and another from Japan.

Pistorinia. Calyx short; corolla tube much elongated, cylindrical; stamens inserted in the throat of the corolla; carpels long, linear. Annual erect herbs, natives of Spain and Algiers.

Umbilicus. Calyx five-parted, equal to, or slightly shorter than, corolla tube; corolla tubular or campanulate, five-cleft; lobes acute; stamens ten, inserted in the corolla; scales five; carpels five; styles subulate. Herbs, indigenous to the South of Europe and the Orient.

CULTIVATION. Most of the Cotyledons succeed in well-drained sandy loam, and are readily propagated by seed; this plan being, of course, the only one for the annual species. Many produce a large number of offsets, which afford a certain and rapid method of increase. With those species from which no offsets are developed, and from which few cuttings can be obtained, recourse must be had to the leaves; these should be pulled—not cut—off in autumn, laid on dry sand, in pans, on a shelf, in a propagating or other warm house, and not watered. After some time, small plants form at the ends of the leaves; these should be carefully watered, and, as soon as large enough to handle, placed in small pots, in sandy soil. *C. gibbiflora metallica* is often used in central positions in bedding-out designs, where it is very distinct and effective. This is rather a tender plant, and one which is sometimes difficult to keep in winter; a dry place in a warm house is the best, and during that season but little water should be given. If the leaves are exposed to drip, or the plants are kept too wet at the roots, they are very liable to damp off. *C. secunda glauca* is very extensively used in gardens, either in single or double lines, as edging plants, or for tracing out designs in carpet bedding. It is hardy enough to stand out in a mild winter, but it is always safer to lift the plants in autumn and place them thickly in a frame where excess of moisture can be guarded against, and frost excluded by means of mats or some other covering. This is one of the easiest to increase, as it annually produces large numbers of side growths, which can be removed and grown into good plants in a comparatively short time. *C. fulgens* is a fine greenhouse winter-flowering plant that deserves extended cultivation, as its thick coral-red, wax-like flowers remain a considerable time in full beauty. It is easily grown, and does not require much heat. It can be propagated by the leaves, or by cutting up the plants after they have done flowering. June is a good time to put in the cuttings, which should be kept close in a cool place until they have rooted. Early in September, they may be removed into 5in. pots, in which they will flower. Strong plants will produce three or four panicles of flowers, which open best in a slightly warm, dry atmosphere; they can then be moved into the greenhouse, where they will last a long time. *C. Pachyphytum*, often used as a centre amongst other dwarf-growing bedding plants, should be kept rather dry during winter, in a frame or house free from frost. It is easily increased by the leaves, treated in the way mentioned at the commencement of this paragraph.

C. adunca (hooked). *fl.* yellow, pink. *h.* 2ft. to 4ft. Mexico. SYN. *Pachyphytum roseum.* (Ref. B. 60.)

C. agavoides (Agave-like).* *fl.* dull orange, few, disposed on a slender stem, which is 8in. to 12in. long. *l.* rosulate, ovate, glaucous-green, fleshy, narrowed to a rigid, spiny point. Mexico. Plant stemless. SYN. *Echeveria agavoides.* See Fig. 535. (Ref. B. 67.)

C. atropurpurea (dark purple).* *fl.* bright red, pentagonal, white towards the base; flower-stem erect, terminating in a long raceme. *l.* obovate-spathulate, dark purple, covered with a

Cotyledon—*continued.*

glaucous "bloom," and aggregated into a dense rosette at the top of the stem, which is short, stout, and glaucous. Mexico, 1869. SYN. *Echeveria atropurpurea.* (Ref. B. 198.)

FIG. 535. COTYLEDON AGAVOIDES.

C. cæspitosa (tufted). *fl.* yellow, cymose. July. *l.* rosulate, narrow, tongue-formed, lanceolate, gradually narrowed to an acute point. *h.* 1ft. California, 1796. SYN. *Echeveria cæspitosa.* (Ref. B. 69.)

C. californica (Californian).* *fl.* pale yellow, disposed on lateral flowering stems, which are 1ft. long, bearing short, ovate, amplexicaul leaves, and a bifid or trifid raceme. *l.* rosulate, ligulate, lanceolate, acute, farinosely-glaucous. *h.* 9in. California, 1855. SYN. *Echeveria californica.* (Ref. B. 70.)

C. canaliculata (channelled). *fl.* red. April. *h.* 2ft. Mexico, 1846. SYN. *Echeveria canaliculata.*

FIG. 536. COTYLEDON CHRYSANTHA.

C. chrysantha (golden-flowered). *fl.* white or cream-coloured. *l.* of the dense rosettes shortly oblong-spathulate, obtuse; the cauline ones elliptic acute. *h.* 3in. to 1ft. Orient. A very inappropriate name, given to the plant by its describer before he had seen it in a living state. SYN. *Umbilicus chrysanthus.* See Fig. 536.

C. clavifolia (club-leaved). *fl.* purple; spikes terminal. September. *l.* petiolate, club-formed, incurved, acuminated, and rather

Cotyledon—*continued.*

curled at the apex. *h.* 6in. Cape of Good Hope, 1824. This species is allied to *C. cristata*, but the flowers are about twice the size.

C. coccinea (scarlet).* *fl.* in axillary, elongated, leafy spikes; corolla scarlet on the outside, and yellow on the inside, or paler. October. *l.* spathulately lanceolate. *h.* 1ft. to 2ft. Plant soft, pubescent. SYN. *Echeveria coccinea.* (B. M. 2572.)

C. Cooperi (Cooper's). *fl.* pink. *h.* 6in. South Africa, 1860. (Ref. B. 72.)

C. coruscans (glittering).* *fl.* orange-coloured, pendulous, disposed in umbellate panicles. June. *l.* decussate, aggregate, cuneate-oblong, channelled, with thick margins, apiculated, covered with white mealiness. *h.* 1ft. to 2ft. Cape of Good Hope, 1818. (B. M. 2601.)

C. cristata (crested). *fl.* small, variegated, open in the morning; spikes terminal. September. *l.* petiolate, cuneately-triangular, dotted, curled, and crested at the apex. Stem short. *h.* 6in. Cape of Good Hope, 1820.

C. decipiens (deceiving). *fl.* white. *h.* 6in. Peru, 1868. SYN. *Echeveria decipiens.*

C. decussata (cross-leaved). Synonymous with *C. papillaris.*

C. fascicularis (clustered). *fl.* panicled, pendulous; corolla with a short, greenish, broad, sub-pentagonal tube, and a reddish-revolute limb. July. *l.* scattered, but in fascicles at the tops of the branches, cuneiform, obtuse, flat, thick. Caudex thickened, branched. *h.* 1ft. Cape of Good Hope, 1759. (B. M. 5602.)

C. fulgens (shining).* *fl.* bright coral-red, yellow at the base, disposed in an irregular panicle of nodding racemes. *l.* obovate-spathulate, pale glaucous-green, arranged in a thin rosette. Stem 4in. to 6in. high, throwing out leafy flowering branches, 12in. to 18in. long. Mexico. SYN. *Echeveria fulgens.* (Ref. B. 64.)

C. gibbiflora (gibbous-flowered). *fl.* on short pedicels along the branches of the panicle, which is spreading; petals gibbous at the base, between the lobes of the calyx, straight, acute, white at the base, and rather scarlet at the apex. July. *l.* flat, cuneiform, acutely mucronate, crowded at the tops of the branches. *h.* 1ft. to 2ft. Mexico, 1826. SYN. *Echeveria gibbiflora.*

C. g. metallica (metallic).* *fl.* yellowish, tipped with red, thirty to sixty in a loose thyrsoid panicle, which is borne on a longish stem. *l.* broad, obovate-spathulate, about 6in. across, and rather more in length, of a beautiful purplish-glaucous metallic hue. Mexico. SYN. *C. metallica.* (Ref. B. 55.) Of this very extensively-cultivated plant there are numerous forms.

C. glaber (smooth). *fl.* yellowish; floral stem 6in. high, cymose-paniculate. *l.* rosulate, spathulate-elliptic. Turkestan, 1880. Hardy. SYN. *Umbilicus glaber.*

C. glauca (glaucous). *fl.* scarlet, tipped with yellow, twelve to twenty in a secund raceme, the stems of which are slender and pinkish. *l.* in a dense rosette, obovate-cuneate, mucronate, and farinosely glaucous. *h.* 6in. Mexico. SYN. *Echeveria glauca.* (Ref. B. 61.)

C. grandiflora (large-flowered).* *fl.* in spicate panicles; corolla of a reddish-orange colour, with a tinge of purple. October. *l.* orbicularly cuneated, all white or glaucous; lower ones rosulate. *h.* 1ft. to 2ft. Mexico, 1828. SYN. *Echeveria grandiflora.*

C. hemisphærica (hemispherical). *fl.* with a green tube, and the limb variegated with white and purple; small, nearly sessile, erect, along an elongated peduncle. July. *l.* scattered, ovate-roundish, thick, dotted, glabrous. *h.* 1ft. Cape of Good Hope, 1751.

C. linguæfolia (tongue-leaved). *fl.* yellowish. *h.* 1ft. Mexico. SYN. *Echeveria linguæfolia.* (Ref. B. 58.)

C. lurida (lurid). *fl.* disposed in racemose spikes; corolla same as in *C. grandiflora*, but more scarlet. July. *l.*, lower ones lanceolate-cuneated, of a livid colour; superior ones lanceolate. *h.* 1ft. Mexico, 1830. Plant rather tufted. SYN. *Echeveria lurida.* (Ref. B. 59.)

C. maculata (spotted). *fl.* in a lax simple raceme; tube of corolla green, sub-ventricose, with the segments of the limb acute, rose-pink; throat white, slightly spotted. July. *l.* scattered, ovate-spathulate, somewhat auricled at the base, fleshy, shining, marked with dark-red spots on both surfaces. *h.* 1ft. Cape of Good Hope, 1816. (Ref. B. 35.)

C. metallica (metallic). A synonym of *C. gibbiflora metallica.*

C. orbiculata (round). *fl.* reddish, panicled. July. *l.* opposite, flat, obovately-spathulate, obtuse, with an acumen, glaucous and mealy, margined with red, *h.* 2ft. to 4ft. Cape of Good Hope, 1690. (R. H. 1857, 347.) The following varieties belong to this species: *elata*, *oblonga*, *obovata*, *ramosa*, and *rotundifolia.*

C. Pachyphytum (thick-plant).* *fl.* red. *h.* 1ft. Mexico. SYN. *Pachyphytum bracteosum.*

C. papillaris (pimpled). *fl.* in panicles; corolla with a somewhat pentagonal tube, and oblong acute reflexed lobes. August. *l.* opposite, terete-ovate, fleshy, glabrous, acute, erect. *h.* 1ft. to 2ft. Cape of Good Hope, 1819. SYN. *C. decussata.* (B. R. 915.)

C. Peacockii (Peacock's).* *fl.*, corolla bright red, under ½in. long; spike scorpioid, 1ft. long; upper flowers close, the lower ones distant. July. *l.* in a close rosette, obovate-spathulate, about 2in. to 2½in. long, and 1½in. broad. Stem lateral, slender, terete, reddish-brown. *h.* 1ft. Mexico, 1874. SYN. *Echeveria Peacockii.*

Cotyledon—*continued.*

C. Pestalozzæ (Pestalozza's).* *fl.* pale rose, sub-secund; panicle glandulously hairy, panicled. *l.*, radical ones spathulate-obtuse, margin obsoletely denticulated; cauline ones obovate-oblong. Cilicia, 1877. SYN. *Umbilicus Pestalozzæ.* (G. C. n. s., viii. 457.)

C. platyphylla (broad-leaved). *fl.* white, cymose-corymbose. *l.*, radical ones rosulate, ovate-spathulate, obtuse, or sub-acute, minutely papillose-hairy. *h.* 9in. Altai, 1880. Hardy. SYN. *Umbilicus platyphyllus.*

C. racemosa (racemose).* *fl.* scarlet, alternate, erect, on short pedicels, very closely resembling those of *C. coccinea*, but the sepals are shorter and mucronate, and the petals are narrower; racemes spike-formed and elongated. October. *l.*, radical ones thickish, elliptic, acute, awnless, rosulate. Plant quite glabrous. *h.* 2ft. Mexico, 1836. SYN. *Echeveria racemosa.*

C. ramosissima (much-branched). *fl.* with a pale green tube, and a pinkish spreading limb, solitary at the tips of the branchlets, drooping, 1½in. long. September. *l.* crowded, opposite, ¾in. to 1in. long, orbicular, obovate, sub-acute or cuspidate, concave, densely fleshy. *h.* 1ft. to 3ft. South Africa. A bushy, succulent, much-branched, erect shrub. (B. M. 6417.)

C. retusa (blunt).* *fl.* yellowish; petals keeled, gibbous at the base; branches few-flowered; panicle dense, sub-corymbose. *l.* obovate-spathulate; old ones retuse, glaucous, crenulated; cauline ones linear-oblong, quite entire. *h.* 1½ft. Mexico, 1846. SYN. *Echeveria retusa.* The varieties *glauca* and *floribunda splendens* are among the best of flowering varieties.

C. rosea (rosy). *fl.*, calyx rose-coloured; corolla yellow; lower bracts triquetrous; spike cylindrical, dense. April. *l.* oval-acute, sometimes rosulate, sometimes imbricated. Plant caulescent. *h.* 1ft. Mexico, 1840. SYN. *Echeveria rosea.*

C. Salzmanni (Salzmann's). *fl.*, corollas brilliant golden, tips of the spreading lobes red; disposed in a broad compoundly corymbose head. July. *l.* fleshy, terete, covered with short red streaks. Stem stout, ascending, leafy. Tangiers, 1869. SYN. *Pistorinia Salzmanni.* (B. M. 5801.)

C. Scheerii (Scheer's). *fl.* creamy-yellow; racemes nutant. October. *l.* ovate-acute, lengthened into the flat petioles. *h.* 1½ft. Mexico, 1841. Plant caulescent. SYN. *Echeveria Scheerii.*

C. secunda (secund). *fl.* reddish-yellow, on long peduncles; racemes secund, recurved. June to August. *l.* rosulate, crowded, cuneate, mucronate, glaucous. *h.* 1ft. Mexico, 1837. This is one of the best for general purposes, and is most extensively grown. SYN. *Echeveria secunda.* It has numerous varieties. The best are: *glauca*, with bluish-white leaves; *glauca major*, a large form of the first-named variety, having leaves not quite so light-coloured; and *ramosa*, a monstrosity in habit of growth—stem flat, broad, and covered at the top with numerous small green abortive leaves, in appearance resembling the inflorescence of a Cockscomb.

FIG. 537. COTYLEDON SEMPERVIVUM.

Cotyledon—*continued.*

C. Sempervivum (House Leek).* *fl.* deep red; peduncles many-flowered. August and September. *l.* rosulate, ovate, sub-acute, dull green, tinged with brown. *h.* 4in. to 6in. Hardy. SYN. *Umbilicus Sempervivum.* See Fig. 537.

C. serrata (saw-like). *fl.* variegated with white and red; peduncles two to three-flowered. June. *l.* oblong, cartilaginously-crenated. Stem sub-spicate. *h.* 6in. Candia, 1732. Hardy. (S. F. G. 444.)

C. spinosa (spiny).* *fl.* yellow, five-parted, on short pedicels, collected into a cylindrical spike. June. *l.* oblong, pointed by a spine at the apex, quite entire; radical ones rosulate, spathulate, convex beneath towards the apex; cauline ones lanceolate, flat. Stem spicate, very simple. *h.* 1ft. Siberia, China, &c., 1810. Hardy. Often called in gardens *Sempervivum spinosum.*

C. teretifolia (terete-leaved). *fl.* yellow. July. *h.* 1½ft. South Africa, 1862.

C. tricuspidata (three-spined). This species is close to *C. papillaris*, but differs in the leaves being tricuspidate. *h.* 1ft. Cape of Good Hope, 1823.

C. tuberculosa (knotted). *fl.* showy, orange-coloured, tubular, 1in. or more long, sub-panicled, erect; limb spreading. June. *l.* scattered, sub-cylindrical, linear-oblong, acute. *h.* 1ft. Cape of Good Hope, 1820.

C. turkestanica (Turkestan). *fl.* white, with purple stripes outside, cymose; floral stem 2in. to 6in. high. *l.*, radical ones in a dense rosette, flat, oblong-lanceolate or spathulate-ovate acute, puberulous, ciliate. *h.* 9in. Turkestan, 1880. Hardy.

C. Umbilicus (Navelwort).* Penny Leaf; Penny Pies; Penny wort. *fl.* yellow, erect; corolla hardly five-cleft to the middle. June. *l.*, lower ones peltate, densely crenated, roundish; bracts a little toothed. *h.* 6in. Britain. Hardy. (Sy. En. B. 539.)

C. velutina (velvety).* *fl.* yellow, green at the base, and margined with red, pendulous; scape erect, with a flat-headed sub-corymbose panicle. *l.* large, opposite, oblong-ovate, fleshy, velvety when young, and somewhat glaucous when old. *h.* 2ft. to 3ft. South Africa, about 1840. (B. M. 5684.)

COTYLEDONS. The rudimentary leaves of the embryo; commonly called Seed Leaves.

COULTERIA (named after Thomas Coulter, M.D., author of a Monograph on the Natural Order *Dipsaceæ*). This is now regarded as a mere section of the large genus *Cæsalpinia.* Stove evergreen shrubs, with spines in the axils of the abruptly pinnate leaves. Flowers yellow, disposed in racemes; pedicels articulated, under the flower. For culture, *see* **Cæsalpinia.** *C. horrida* and *C. tinctoria* are the only two species which have been introduced into this country, and probably these are only seen in botanic gardens.

COUROUPITA (native name). A small genus, containing four species of trees belonging to the TRIBE *Lecythideæ* of ORD. *Myrtaceæ.* The clusters of flowers spring from the trunks and branches. Leaves alternate, entire or obscurely crenate; stipules lanceolate, deciduous. All are natives of tropical America; none are met with in cultivation, except in botanic gardens. The best-known is *C. guianensis* (the Cannon-ball tree), the cup-like fruit shells serving various purposes.

COURSETIA (named after Dumont de Courset, 1746-1824, author of "Le Botaniste Cultivateur," five vols., 8vo, Paris, 1802; and co-editor of the "Bon Jardinière"). ORD. *Leguminosæ.* A genus of stove evergreen tomentose shrubs. Flowers bluish, in axillary racemes. Leaves abruptly pinnate, with many pairs of small ovate leaflets; the common petiole sometimes terminating in a bristle, but rarely in an odd leaflet; stipules setaceous. They thrive well in a compost of loam and peat, well drained. Cuttings of firm young shoots will root in sand, during the early part of summer, if placed in a mild bottom heat and covered with a bell glass. There are about ten species, all natives of the warmer parts of the New World.

COUSINIA (named after M. Cousin, a French botanist). ORD. *Compositæ.* Hardy biennials and perennials, rarely annuals. The only European member of the genus is *C. wolgensis*, a native of Southern Russia. More than a hundred species of *Cousinia* have been described, all of them, with the exception just named, being Asiatic. They are all of the easiest culture. *C. hystrix* is probably the

Cousinia—*continued.*

only one now grown. This may be increased by dividing the roots in spring; or from seed, sown in a cold frame.

C. hystrix (bristly). *fl.-heads* purplish, disposed in solitary, somewhat globose, woolly heads. June. *l.* pinnatifid, or pinnate, with spiny teeth, covered on both surfaces with a cobweb-like down. Stem branching at top. *h.* 2ft. Orient, 1838. Hardy herbaceous biennial.

COUTAREA (the native name in Guiana). ORD. *Rubiaceæ.* A small genus of stove evergreen trees, from tropical America. Some of the species are believed to furnish the Cinchona bark of French Guiana. They are of easy culture in a compost of loam, sand, and peat. Cuttings will root readily in the same kind of soil, under a hand glass, in heat.

C. speciosa (showy).* *fl.*, corolla purple, large, broad, funnel-shaped; peduncles trifid, three-flowered. *l.* ovate, acuminated, on very short petioles, glabrous; stipules broad, short, acute. *h.* 25ft. Guiana, 1803.

COUTOUBEA (Caribbean name of one of the species). SYN. *Picria.* ORD. *Gentianeæ.* A small genus of erect stove herbs. Flowers white or purplish, disposed in terminal and lateral spikes or racemes, dense or loose, bracteate; corolla salver-shaped, with an equal cylindrical tube, or naked throat, and a four-parted limb. Leaves opposite, rarely whorled, decussate, sessile, or amplexicaul, one-nerved, thinnish, veined. Stems obscurely tetragonal, usually branched; branches opposite, and thickened at the roots. All are of the easiest culture, requiring the same treatment as other tender annuals.

C. ramosa (branching). *fl.* white, decussate, remote; spikes terminal, axillary, the lower part leafy. June. *l.* oblong-lanceolate, acuminate at both ends. Stems divaricately branched. *h.* 1ft. to 2ft. Guiana, 1824.

C. spicata (spicate). *fl.* decussate, rather close together; corolla white, reddish in the throat; spikes terminal, elongated, loose. July. *l.* lanceolate, acuminated at both ends. Stem erect, branched. *h.* 2ft. to 3ft. Guiana, 1823.

COWAGE. *See* **Mucuna.**

COWANIA (in honour of James Cowan, a London merchant, who several times visited Mexico and Peru, whence he introduced a great many plants). ORD. *Rosaceæ.* A genus of very ornamental greenhouse evergreen shrubs, natives of Mexico and the adjacent interior region northward. They are extremely difficult to propagate. Perhaps the only one of the three species yet introduced is *C. plicata.* It requires a sandy peat and loam soil.

C. ericæfolia (Heath-leaved). *fl.* white, smaller. *l.* linear, entire. Found only by Parry, on the Rio Grande.

C. mexicana (Mexican).* *fl.* yellow. *l.* cuneate-obovate, pinnately three to seven-lobed, dark green above, tomentose beneath. *h.* 1ft. to 6ft. Mountains of California to Mexico.

C. plicata (plaited).* *fl.* dark red, terminal, solitary, almost sessile; when protruding from the bud, exactly like those of *Rosa.* June and July. *l.* simple, alternate, wedge-shaped, oblong, pinnatifid, plaited. *h.* 1ft. to 2ft. Mexico, 1835. A rigid, decumbent, much-branched shrub. (S. B. F. G. 400.)

COW BERRY. *See* **Vaccinium Vitis-Idæa.**

COWDUNG. For potting purposes, this is highly valued. It should be collected and stored in a shed, where it can be frequently turned, and allowed to remain until nearly dry before being used. For manure water, fresh Cowdung may be employed, if plenty of clear water is added.

COW GRASS. *See* **Trifolium medium.**

COWHAGE. *See* **Mucuna.**

COWHAGE CHERRY. *See* **Malpighia urens.**

COW ITCH. *See* **Mucuna.**

COW-ITCH CHERRY. *See* **Malpighia urens.**

COW PARSLEY and **COW PARSNIP.** *See* **Heracleum.**

COWSLIP. *See* **Primula veris.**

COW-TREE. *See* **Galactodendron.**

COW WHEAT. *See* **Melampyrum.**

CRAB APPLE. *See* **Pyrus Malus.**

CRAMBE (name deduced from the Greek). Sea-kale. ORD. *Cruciferæ*. Hardy herbaceous perennials. Flowers white, with a honey-like perfume; racemes elongated, many-flowered, disposed in lax panicles; pedicels filiform, erect, bractless. Leaves sometimes thick, sometimes membranous, hairy or smooth; cauline ones alternate, stalked, pinnately toothed, cut, pinnatifid or lyrate. They are of easy growth in any good garden soil, and may be increased either by dividing the roots, or by seed. For special culture of *C. maritima*, see **Sea-kale.**

C. cordifolia (heart-leaved).* *fl.* white, disposed in leafless, smooth, and much-branched panicles. June. *l.* stalked, toothed; lower ones cordate, upper ones ovate, and are, as well as the stem, almost glabrous. *h.* 6ft. North Caucasus. This is a hardy large-leaved herbaceous plant.

C. juncea (rush-like). *fl.* whitish. May to June. *l.* lyrate, with toothed lobes; terminal lobe the largest; leafstalk and stem hispid from reflexed hairs. *h.* 2ft. Iberia, 1820.

FIG. 538. SEA-KALE (CRAMBE MARITIMA).

C. maritima (sea). Common Sea-kale. *fl.* white. May. *l.* roundish, sinuate, waved, toothed, and, as well as the stem, very smooth. *h.* 1½ft. Britain, &c. See Fig. 538. (Sy. En. B. 80.)

C. tartarica (Tartarian). *fl.* white. June and July. *l.*, radical ones decompound; leaflets cut-toothed; younger leaves rough; adult ones smooth, as well as the stem. Root fusiform, 2ft. to 3ft. long. *h.* 2ft. to 3ft. Eastern Europe, 1789.

CRANBERRY. *See* **Oxycoccus palustris.**

CRANE FLY, or **DADDY LONG LEGS** (*Tipula maculosa* and *T. oleracea*). These insects belong to a large family of the Diptera, or two-winged insects, called *Tipulidæ*, in which the proboscis is very short and imperfectly developed. The larvæ generally prefer wet soil, and are killed when deprived of moisture; while many are wholly aquatic. As an example of Crane Flies in general, one of the commonest and most destructive species, namely *Tipula*

FIG. 539. CRANE FLY (TIPULA OLERACEA).

oleracea (see Fig. 539), is here briefly described. This insect is rather large, the male being nearly ⅔in. long, and 1½in. across the wings; while the female measures nearly 1in. in length, and 2in. across the expanded wings. The colour is tawny, but the fly has the appearance of being covered with dust. The wings are smoke-coloured, and somewhat longer than the body. The balancers, behind the wings, are broad at the tip. The head is small, and

Crane Fly, or **Daddy Long Legs**—*continued.*

bears a pair of hemispherical black eyes, and the short, slender, thirteen-jointed antennæ. The thorax is of a tawny hue, large, and oval, considerably higher than the head, long, and composed of three segments. The female is distinguished from the male in having the end of the body long and spindle-shaped, instead of clubbed, as in the male. The grubs of this fly are of a dark grey colour, and measure, when full grown, about 1½in. in length, and ⅜in. in diameter. They have no legs, but have a pair of powerful jaws, and the tail is tubercled. Their skin is exceedingly tough; hence, they are called "Leather Jackets." These grubs are very destructive to lawns, in sheltered, dry places, and also to Cabbages and other cruciferous plants. No perfect means of extermination has yet been discovered, and the only two remedies of any service in materially reducing the quantity of either grubs or flies, are as follows:

Traps. These consist of slices of potato, turnip, wurzel, or apple, affixed to sticks, and sunk a few inches underground. They must be pulled up every other day, and the grubs, which will be found firmly attached to them, removed and destroyed.

Rolling. On lawns, so soon as the flies are visible, rolling with a heavy roller each evening will destroy very many.

A top-dressing of guano has also been found of use.

Fowls, starlings, and rooks will devour large numbers of the flies, and are therefore useful. It has usually been found that the grubs were not affected by any preparation which did not, at the same time either injure or destroy the plants.

CRANE'S BILL. *See* **Geranium.**

CRASPEDARIA. *See* **Polypodium.**

CRASSULA (diminutive of *crassus*, thick; alluding to the leaves and stems). Including *Rochea*, *Septas* (of Linnæus), and *Turgosea*. ORD. *Crassulaceæ*. A genus of about 120 species of greenhouse fleshy shrubs or herbs, nearly all natives of the Cape of Good Hope, a few being Abyssinian and Himalayan. Calyx five-parted; lobes erect or spreading, much shorter than the petals; petals five, erect or spreading, free or connate at the base; stamens five; filaments shorter than the petals; scales five, varying in shape. Sometimes, though rarely, the parts of the flower, instead of being in fives, as described above, are in sixes and nines. Crassulas are very ornamental plants, with a grotesque appearance. They thrive in a mixture of sandy loam and brick rubbish, in well-drained pots. Propagated by cuttings, which should be taken off and laid for two or three days in the sun, to dry. All the species mentioned below are from South Africa.

C. acutifolia (acute-leaved). *fl.* white; cymes small, pedunculate. September. *l.* opposite, fleshy, terete, subulate, spreading, glabrous. Stem suffruticose, decumbent, branched, terete. 1795.

C. alpestris (alpine). *fl.* white; cymes terminal, few-flowered, corymbose. *l.* fleshy, connate, shortly cultrate, sub-acute, keeled, glabrous. Stem suffruticose, short, branched, with short internodes, nearly glabrous. *h.* 3in. to 4in. 1878.

C. arborescens (woody).* *fl.* rose-coloured, large; cymes panicled, trichotomous. May. *l.* opposite, roundish, mucronulate, fleshy, flat, glaucous, dotted above, glabrous. Stem shrubby, erect, terete. *h.* 2ft. to 3ft. 1739. SYN. *C. Cotyledon.* (B. M. 384.)

C. bibracteata (two-bracteate). *fl.* white; anthers sulphur-coloured. August and September. *l.* subulate, expanded, flat or furrowed above; bracts two on each peduncle. Plant effuse, shrubby, decumbent, rooting. *h.* 6in. 1823.

C. Bolusii (Bolus's).* *fl.* pale flesh-colour. Summer. *l.* elliptic, lanceolate, fleshy, pale green, with dark, almost black, blotches. *h.* 3in. to 5in. 1875. Perennial herb. (B. M. 6194.)

C. ciliata (ciliated).* *fl.* cream-coloured; corymbs terminal. July. *l.* oval, obtuse, flattish, distinct, ciliated; cilia white, cartilaginous, usually retrograde. Stem suffruticose, sparingly branched. *h.* 6in. 1732.

C. coccinea (scarlet).* *fl.* scarlet; tube 1in. long. June to August. *l.* ovate-oblong, acutish, connate, and sheathing at the base. *h.* 1ft. to 3ft. Table Mountain, 1710. Shrub. SYN. *Kalosanthes coccinea.* See Fig. 540. (B. M. 495.)

C. Cooperi (Cooper's).* *fl.* white, numerous, small. Winter. *l.* oblong lanceolate. Habit neat, trailing. 1862. (R. G. 786.)

C. cordata (heart-shaped). *fl.* reddish; cymes panicle-formed. May. *l.* opposite, petiolate, cordate, obtuse, quite entire, dotted above, glabrous. Stem shrubby. *h.* 1ft. to 3ft.

Crassula—*continued.*

C. Cotyledon (Cotyledon-like). A synonym of *C. arborescens.*

C. ericoides (Heath-like).* *fl.* snow-white, small, five to ten disposed in an umbellate cyme. September. *l.* three to four lines long, ovate-oblong, flat, closely imbricated in four rows. Branchlets distant. *h.* 6in. 1820. Plant shrubby, between erect and decumbent. Described as an elegant species.

C. falcata (sickle-leaved).* *fl.* bright crimson, rarely white, with the tube about four lines long, forming a large, densely terminal corymb. June to September. *l.* rather connate, thick, glaucous, oblong, bluntish, bent down in the form of a sickle. *h.* 5ft. to 8ft. 1795. Shrub. SYN. *Rochea falcata.* (B. M. 2035.)

C. glomerata (clustered). *fl.* white, solitary in the forks of the stems; ultimate ones glomerate. August. *l.* opposite, linear-lanceolate. Stems scabrous, dichotomous. *h.* 2in. to 4in. 1774. Annual.

C. imbricata (imbricated). A synonym of *C. lycopodioides.*

C. jasminea (Jasmine-flowered).* *fl.* white at first, but becoming reddish as they fade, very like those of the common Jasmine, scentless, capitate; tube of corolla almost three times longer than the calyx. April, May. *l.* lanceolate, sessile, bluntish. 1815. Shrub decumbent. A beautiful plant, largely grown near London for decorative purposes. SYNS. *Rochea jasminea* and *Kalosanthes jasminea.* (B. M. 2178.)

FIG. 540. CRASSULA COCCINEA.

C. lactea (milky-white).* *fl.* snow-white, stellately spreading; cymes panicled, many-flowered, trichotomous. Winter. *l.* ovate, attenuated at the base, and connate, glabrous, dotted within the margin. Stem shrubby, terete, branched, twisted below. *h.* 1ft. to 2ft. 1774. (B. M. 1771.) There is a form of this with prettily variegated leaves. Both type and variety are excellent winter-flowering plants.

C. lycopodioides (Lycopodium-like). *fl.* axillary, sessile, bracteolate; corolla purple at the base, small. *l.* decussate, ovate, acute, smooth, imbricating in four rows. Stem shrubby, branched, covered with leaves on all sides. SYN. *C. imbricata.*

C. marginalis (marginal).* *fl.* white, disposed in umbellate corymbs. July. *l.* perfoliate, roundish-ovate, ending in a recurved mucro, flat, spreading, reddish beneath, quite entire, with cartilaginous margins, which are at first reddish, but at length become white. Stem herbaceous, glabrous, pellucid, creeping. 1774. SYN. *C. profusa.* (B. M. 6044.)

C. perfoliata (perfoliate). *fl.* scarlet, disposed in large, terminal corymbs. July, August. *l.* connate, lanceolate, acuminated, rather channelled above, convex beneath, of a greenish glaucous colour. *h.* 3ft. to 6ft. 1700. Shrub. SYN. *Rochea perfoliata.* (A. B. R. 656.)

C. profusa (profuse). A synonym of *C. marginalis.*

Crassula—*continued.*

C. pyramidalis (pyramidal). *fl.* whitish, small, inconspicuous. *l.* four-ranked, very densely imbricate. South Africa. Herbaceous. A very curious plant, from its habit. (G. C. 1872, 289.)

C. quadrifida (four-cut). *fl.* white, tinged with red, panicled, tetramerous. Summer. *l.* oblong-spathulate; upper ones rounder, decussate. 1872. Perennial. (Ref. B. 298.)

C. rosularis (rosulate).* *fl.* white, in opposite, pedunculate clusters. July. *l.* radical, obtuse, minutely ciliated, flat, rosulate. *h.* 6in. 1819. Herbaceous.

C. rubicunda (rubicund). *fl.* crimson, in terminal dichotomous cymes, 6in. to 1ft. across. *l.* in opposite pairs, clasping the stem and broadly connate at the base, lanceolate, green, reflexed, narrowed gradually to a point, minutely ciliated; lower ones 6in. to 8in. long; upper ones gradually laxer and smaller. *h.* 1ft. to 3ft. (Ref. B. 339.)

C. Saxifraga (Saxifraga-like). *fl.* flesh-coloured, on slender, terminal scapes. June. *l.* orbicular or sub-reniform, fleshy, 2in. to 3in. across, red beneath. *h.* 4in. 1873. (B. M. 6068.)

C. spathulata (spathulate). *fl.* rose-coloured; cymes pedunculate, paniculate. July. *l.* opposite, petiolate, roundish, crenated, glabrous, shining above. Stems suffruticose, decumbent, branched. 1774. (L. B. C. 359, under the name of *C. cordata.*)

C. tetragona (four-angled). *fl.* white, small, nearly urceolate, disposed in a pedunculate fastigiate cyme. August. *l.* decussate, sub-connate, depressed above, subulate, somewhat tetragonal, incurved, spreading, glabrous. Stem erect, shrubby, terete, somewhat rooting. *h.* 2ft. 1711.

C. versicolor (changeable).* *fl.* in umbels at the extremities of the branches, sweet-scented in the evening: corolla hypocrateriform, with a long tube; limb shorter than the tube, five-cleft; segments somewhat recurved, bright red on the outside, and white within, except a red margin, which gradually extends over the whole. Summer. *l.* imbricate, lanceolate, hollowed, especially towards the base, connate, sheathing, edged with minute ciliæ. Stem shrubby, erect, branched. SYNS. *Rochea versicolor* and *Kalosanthes versicolor.* (B. M. 2356.)

CRASSULACEÆ. An extensive order of usually succulent herbs or shrubs. Flowers in terminal or axillary cymes, bracteate or not clustered, often secund; petals three to five, rarely ten to twelve or more, separate or united, imbricate in bud. Leaves alternate or opposite, exstipulate, often crowded in rosettes at the extremities of the branches. There are about fourteen genera, including *Bryophyllum, Crassula, Sedum,* and *Sempervivum,* and about 400 species.

CRATÆGUS (from *kratos,* strength; in reference to the hardness and strength of the wood). Hawthorn. ORD. *Rosaceæ.* Hardy shrubs or small trees, often spiny. Flowers mostly white, in terminal corymbose cymes; bracts subulate, deciduous. Fruit ovoid or globose, with a bony one to five-celled stone, or with five bony one (rarely two) seeded stones. Leaves simple, lobed, or pinnatifid. There are about fifty species, all of which are confined to North temperate regions. In the New World, the home of the majority of the species, the genus extends into New Grenada. Few hardy shrubs are more useful and ornamental than the Hawthorn. It makes, perhaps, a better hedge than any other shrub, as it grows quickly, and will generally thrive in most soils. When preparing plants for this purpose, the fruits, or "haws," should be gathered in October, and laid in a heap to rot, being at first spread rather thinly, to prevent heating. They should then be mixed with about one-third their bulk of either fine sifted soil or sand, and be overlaid with a covering of soil, from 4in. to 6in. in thickness. Here they may remain till the time of sowing—in October of the following year—though some cultivators prefer to sow in spring, in order to avoid the depredations of mice, &c. The ground should be previously well dug and cleaned. The seed may be sown in drills, 1½in. deep, and 12in. from each other. They should be evenly spread in the furrows, at the rate of half a bushel of mixed seed and sand to forty yards of furrow, and then covered by means of a rake. The surface should, however, be left a little rough, so as to break the effects of rain, which is apt to cause it to cake, when made very fine. So soon as the seedlings show themselves above ground, the hoe should be passed between the rows, to loosen the earth and clear it of weeds. With good management, a bushel of seed will produce about 4000 plants.

Cratægus—*continued.*

The majority of nurserymen never follow the plan above described, but simply sow the seed in beds from 3ft. to 4ft. wide, leaving alleys about 1ft. in width, to allow the beds to be weeded by hand or watered. The largest seedlings are removed for transplantation at the end of the first year. A succession of seedlings will often be furnished by an ordinary seed-bed for about three years. When the time comes round for transplanting, in October, the young plants should be lifted, by first loosening the earth with a spade, on each side of the row, and the strongest drawn out. The small ones remaining should stand for another year, after the soil is again trodden down. Transplanting is best performed by cutting out a perpendicular trench, from 6in. to 8in. deep, in which plants are placed singly by the hand, the roots being previously shortened with a sharp knife, to make them grow bushy. The soil should then be trodden firmly about them. The plants should be allowed to stand in these drills for two years, or even three, before being permanently placed out. Such is the plan pursued by those who require a large number of plants; but, for general purposes, it is best to purchase the "quicks" of nurserymen, whose special business it is to rear them. The different varieties to be increased, must be grafted or budded. The rules for both these methods are very similar to those laid down for other trees or shrubs. *See* **Budding** and **Grafting.** When in a young state, Hawthorns, especially the double pink and white varieties, make very desirable pot plants, and will bear a slight amount of forcing. By this means, they serve as excellent early spring ornaments for decorative purposes. The pyramid or standard form is most suitable and pleasing for pot plants.

C. apiifolia (Apium-leaved). *fl.* white; pedicels of the corymb usually simple, and, as well as the oblong tube of the calyx, villous. May and June. *fr.* deep red, ovoid. *l.* deltoid, pinnately five to seven-cleft; lobes acute, deeply toothed. *h.* 8ft. to 10ft. United States, 1812.

C. Aronia (Aronia). *See* **C. maura.**

C. Azarolus (Azarole). *fl.* white, sweet-scented. May. *fr.* red or yellow, ovate, globose, with a very agreeable taste when fully ripe. *l.* pubescent, cuneated at the base, trifid; lobes obtuse, coarsely few-toothed. Branches, corymbs, and calyces pubescent. *h.* 15ft. to 20ft. South Europe, Levant, &c., 1640. (B. R. 1897.)

C. caroliniana (Carolina). A synonym of *C. flava.*

C. carpatica (Carpathian). A synonym of *C. nigra.*

C. coccinea (scarlet). *fl.* white; petals orbicular. May. *fr.* bright coral-red, ovoid, large, scarcely edible. *l.* roundish-ovate, sharply toothed and cut, glabrous. *h.* 20ft. to 30ft. United States, 1683. (B. M. 3432.) A large number of varieties of this species may be raised from seed. The following are those generally known: *corallina* (coralline), *glandulosa* (glandular), *indentata* (indented-leaved), *macracantha* (large-spined), *maxima* (largest), *minor* (smaller-fruited), *neapolitana* (Neapolitan), *subvillosa* (slightly-hairy).

C. cordata (heart-shaped). Washington Thorn. *fl.* white. May and June. *fr.* red, very small, depressed, globose. *l.* broadly ovate or triangular, mostly truncate, or a little heart-shaped at the base. *h.* 6ft. to 10ft. United States, 1738. SYN. *C. populifolia.* (B. R. 1151.)

C. Crus-galli. Cockspur Thorn. *fl.* white, tinged with red; anthers red. May. *fr.* scarlet, edible. *l.* obovate-cuneiform, nearly sessile, shining, glabrous, falling off late in the autumn; stipules linear. Spines very long. *h.* 10ft. to 30ft. North America, 1691. SYN. *C. lucida.* (W. D. B. 56.) The following are varieties of this species:

C. C.-g. linearis (linear). *l.* linear, lanceolate. Spines few, shorter.

C. C.-g. nana (dwarf). *l.* ovate-lanceolate, paler beneath.

C. C.-g. ovalifolia (oval-leaved).* *fl.* white. May and June. *l.* oval, serrated, rather pilose on both surfaces, shining above; stipules half cordate, deeply serrated, glandular. *h.* 10ft. to 20ft. United States, 1810. (B. R. 1860.)

C. C.-g. prunifolia (Prunus-leaved).* *fl.* white; peduncles and calyces rather villous. May and June. *l.* broad-ovate, unequally serrated, glabrous; petioles rather glandular. *h.* 15ft. to 20ft. North America, 1818. (B. R. 1868.)

C. C.-g. pyracanthifolia (Pyracantha-leaved). *l.* oblong-lanceolate, somewhat cuneiform. SYN. *C. salicifolia.*

C. C.-g. splendens (splendid). *l.* obovate-cuneiform.

C. Douglasii (Douglas's).* *fl.* white. May. *fr.* dark purple, small. *l.*, some obovate, some oval, doubly serrated, wedge-shaped at the base, glabrous. Branches ascending; spines rigid, straightish. *h.* 10ft. to 15ft. North-west America, 1827. (B. R. 1810.)

C. flava (yellow).* *fl.* white, usually solitary. May. *fr.* yellow, turbinate, edible. *l.* obovate-cuneiform, somewhat lobate, crenate-serrated; petioles short; stipules cordate, and, as well as the calyces, glandular. *h.* 12ft. to 20ft. United States, 1724. SYN. *C. caroliniana* and *C. glandulosa.* (B. R. 1939.)

C. florentina (Florentine). *fl.* white. May. *fr.* ovate, globose. *l.* ovate-oblong, cordate at the base, deeply serrated, tomentose beneath, as well as on the calyces. *h.* 20ft. to 30ft. Florence, 1800.

C. glandulosa (glandular). A synonym of *C. flava.*

C. heterophylla (various-leaved).* *fl.* white; corymbs many-flowered, glabrous. May. *l.* glabrous, falling off very late in the season, cuneiform-lanceolate, somewhat three-lobed or pinnatifid at the apex; lobes sub-serrated, acute. *h.* 10ft. to 20ft. Orient, 1816. (B. R. 1161, 1847.)

C. lucida (shining). A synonym of *C. Crus-galli.*

C. maroccana (Marocco). A synonym of *C. maura.*

C. maura (Mediterranean). *fl.* white; pedicels elongated; corymbs terminal, glabrous. May. *fr.* scarlet. *l.* cuneated, three-lobed and pinnatifid, glabrous and glandless; stipules sub-palmately cut. *h.* 15ft. to 20ft. South Europe, 1822. SYNS. *C. Aronia* and *C. maroccana.*

C. melanocarpa (black-fruited). *fl.* white; calycine lobes reflexed, villous. May and June. *fr.* black. *l.* usually trifid, serrated in front, acutish at the base. *h.* 10ft. to 20ft. Tauria, 1820. SYN. *C. Oxyacantha Oliveriana.* (B. R. 1933.)

C. mexicana (Mexican). *fl.* white, large; corymbs terminal. June. *fr.* large, pale green, or yellowish, when ripe resembling a small apple, but not edible. *l.* oval-lanceolate, notched and serrated, acuminate, somewhat ciliated at the base; petioles short, channelled, with a winged margin. *h.* 10ft. to 15ft. Mexico, 1824. Evergreen against a wall, and sub-evergreen as a standard, in the climate of London and southwards. (B. R. 1910.)

C. microcarpa (small-fruited). A synonym of *C. spathulata.*

C. nigra (black).* *fl.* white; calyces villous. May and June. *fr.* black. *l.* lobately sinuated, serrated, truncate, and somewhat cuneated at the base, clothed with hoary villi beneath; stipules oblong, doubly serrated. *h.* 10ft. to 20ft. Eastern Europe, 1819. SYN. *C. carpatica.* (L. B. C. 1021.)

C. odoratissima (very sweet-scented).* *fl.* white, very sweet-scented, corymbose. May and June. *fr.* yellow, globular, large. *l.* deeply pinnatifid, pubescent; lobes lanceolate, acute, serrated. *h.* 10ft. to 20ft. Crimea. (B. R. 1885.)

C. orientalis (Eastern).* *fl.* white. May and June. *l.* three-lobed, pubescent beneath; lobes ovate, deeply toothed at the apex, the middle one trifid; stipules broad, cut. Branches clothed with hoary tomentum. *h.* 12ft. to 20ft. Levant, 1810. SYN. *C. sanguinea.* (B. R. 1852.)

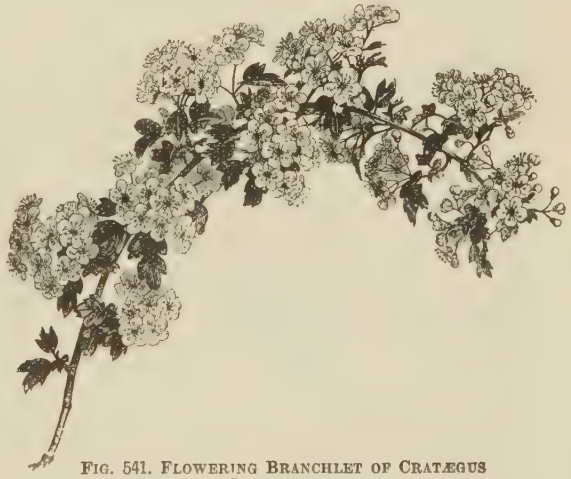


FIG. 541. FLOWERING BRANCHLET OF CRATÆGUS OXYACANTHA.

C. Oxyacantha (sharp-spined).* Common Hawthorn; Whitethorn. *fl.* white, occasionally pink, sweet-scented, corymbose. Spring. *fr.* dark red, occasionally yellow, mealy, insipid. *l.* obovate-cuneiform, trifid or pinnatifid, glabrous and shining. *h.* 10ft. to 20ft. Britain. See Fig. 541. The varieties of this are very numerous. The following are the most important:

C. O. petala (without petals). *fl.* without petals, or nearly so.

C. O. aurantiaca (orange).* *fr.* orange-coloured.

C. O. aurea (golden).* *fr.* roundish, golden-yellow. A most distinct variety.

Cratægus—*continued.*

C. O. capitata (headed). Of a somewhat fastigiate habit, and producing its flowers in close heads, mostly at the extremities of its branches.

C. O. eriocarpa (woolly-fruited).* *fr.* woolly when young. A robust, rapidly-growing variety, with large leaves, strong thick shoots, a clear white bark, and few thorns.

C. O. filicifolia (fern-leaved).* *l.* deeply cut, fern-like.

C. O. flexuosa (zigzag). Branches small, twisted in a zigzag manner.

C. O. flore-pleno albo (white double-flowered). *fl.* white, dying off a beautiful pink, double, produced in great profusion.

C. O. foliis-argenteis (silver-leaved). *l.* variegated with white.

C. O. foliis-aureis (golden-leaved). *l.* variegated with yellow.

C. O. horrida (horrid). A very prickly variety.

C. O. laciniata (cut).* *l.* finely cut, plant less robust, and the fruit smaller than in the type.

C. O. obtusata (obtuse). Distinguished from the type by its smaller, obovate, less cut, flat, and shining leaves.

C. O. Oliveriana (Oliver's). A synonym of *C. melanocarpa.*

C. O. præcox (early).* Glastonbury Thorn. *fl.* frequently out on Christmas Day. *l.* appearing in January or February.

C. O. pteridifolia (Pteris-leaved).* This resembles the variety *laciniata*, but the leaves are longer in proportion to their breadth, and more elegantly cut.

C. O. punicea (scarlet). A synonym of *C. O. rosea-superba.*

C. O. quercifolia (Oak-leaved). Oak-leaved. Very distinct.

C. O. rosea (rose-coloured). *fl.*, petals pink, with white claws.

C. O. rosea-superba (superb rose-coloured) has larger petals, which are of a dark red, without white on the claws. SYN. *C. O. punicea.*

C. O. sibirica (Siberian). An early-leafing variety.

C. parvifolia (small-leaved). *fl.* white, small, usually solitary. May. *fr.* yellow, rather turbinate. *l.* obovate-cuneiform, deeply serrated, pubescent; stipules setaceous. *h.* 6ft. United States, 1704. SYN. *Mespilus parvifolia.* (W. D. B. 65.)

C. populifolia (Poplar-leaved). A synonym of *C. cordata.*

C. punctata (dotted). *fl.* white; calyx rather villous. May. *l.* obovate-cuneiform, glabrous, serrated. *h.* 15ft. to 20ft. United States, 1746. (W. D. B. 57.) There are varieties of this species with either yellow or red fruit, which are usually dotted.

FIG. 542. FRUITING BRANCH OF CRATÆGUS PYRACANTHA.

C. Pyracantha (Pyracantha).* Evergreen Thorn. *fl.* white. May. *fr.* of a beautiful scarlet colour, about the size of a pea, disposed in cymes, remaining on the tree nearly all the winter. *l.* glabrous, evergreen, ovate-lanceolate, crenate. *h.* 10ft. to 20ft. South Europe, &c., 1629. See Fig. 542. There are one or two forms of this species.

C. pyrifolia (Pyrus-leaved). *fl.* white. June. *fr.* yellowish-red, small. *l.* ovate-elliptic, deeply serrated, rather plicate and somewhat hairy. *h.* 6ft. to 10ft. United States, 1765. (B. R. 1877.)

C. salicifolia (Willow-leaved). A synonym of *C. Crus-galli pyracanthifolia.*

C. sanguinea (bloody). A synonym of *C. orientalis.*

Cratægus—*continued.*

C. spathulata (spathulate). *fl.* white; corymbs few-flowered; pedicels short; calyces tomentose. May. *l.* small, in fascicles, narrowed a long way at the base, somewhat spathulate and trifid. Spines strong. *h.* 8ft. to 12ft. United States, 1806. SYN. *C. microcarpa.* (B. R. 1846.)

C. tanacetifolia (Tansey-leaved).* *fl.* white; calycine lobes acutish, reflexed, hairy. May. *fr.* greenish-yellow, globose. *l.* deeply pinnatifid, downy; lobes oblong, acute, few-toothed. *h.* 12ft. to 20ft. Levant, 1789. (B. R. 1884.)

CRATÆVA (named after *Cratevas*, a Greek botanist, who lived in the time of Hippocrates). Garlic Pear. ORD. *Capparideæ.* Unarmed stove evergreen shrubs or trees, with terminal cymes or racemes of large flowers, and trifoliolate leaves. They require a compost of loam, peat, and rotten dung. Cuttings will root freely, if planted in a pot of sand, and placed under a hand glass, in heat.

C. Tapia (Tapia). *fl.* whitish, on long peduncles, forming loose terminal panicled racemes. *fr.* as large as an orange, and, when ripe, having a strong scent of garlic, which is communicated to the animals that feed on it. *l.*, leaflets ovate-acuminated, unequal at the base. *h.* 30ft. to 40ft. Tropical America, &c., 1752.

Other species usually enumerated as being in cultivation are: *gynandra, Roxburghii,* and *tapioides.*

CRAWFURDIA (named after John Crawfurd, a Governor of the Island of Singapore; author of a History of the Indian Archipelago). SYNS. *Pterygocalyx, Trichterospermum.* ORD. *Gentianeæ.* Six or seven species of showy, half-hardy, glabrous, twining herbs, natives of East Indies, the Malayan Archipelago, Japan, and Manchuria. Flowers pale blue, axillary, solitary or in fascicles, large and showy. Leaves opposite, three-nerved, acuminated. Branches elongated, slender. Crawfurdias thrive in a mixture of loam, sand, and peat, with thorough drainage. They may be increased by cuttings, or by seeds. The latter should be sown in a gentle heat, in spring; and, in the middle of May, the seedlings should be transplanted at the foot of a south wall, outside.

C. fasciculata (fascicled).* *fl.* purple, large; corolla tubular; limb furnished with accessory segments; peduncles short, fascicled, bibracteate. August. *l.* lanceolate, acuminated, three to five-nerved. Himalayas, 1855. (B. M. 4838.)

C. luteo-viridis (yellowish-green). *fl.*, corolla between funnel and bell-shaped, twice as long as the calyx lobes; tube green; limb white, with green folds. *l.* ovate, ovate-cordate, or ovate-lanceolate; margin entire, or waved. Stem slender, red with age. Sikkim Himalayas. A very showy twiner when laden with its ellipsoid, cylindric, brilliant red fruits. (B. M. 6539.)

C. speciosa (showy).* *fl.* purple, solitary, on long, nearly naked pedicels; corolla campanulate, without accessory lobes or segments. *l.* ovate, acuminated, five-nerved. Himalayas, 1879.

CREEPERS, or **TRAILERS,** differ from climbing plants in assuming both a procumbent and pendent disposition. They are very generally suitable for growing in baskets and for furnishing rockeries.

CREEPING SAILOR. *See* **Saxifraga sarmentosa.**

CRENATE. Having convex flat teeth.

CRENULATE. Having small round notches.

CREOSOTE PLANT. *See* **Larrea mexicana.**

CREPIDARIA. A synonym of **Pedilanthus.**

CREPIS (from *krepis*, a slipper). Hawksbeard. ORD. *Compositæ.* About 130 species of hardy annuals or perennials, with slender, simple, white (rarely brown) silky pappus hairs, in many series; achenes cylindrical, striate, the beak long, short, or absent. Two only are worth growing. *C. aurea* is a neat border perennial, and *C. rubra* a pretty annual; both thrive in sandy soil. *C. aurea* may be propagated by division, in spring; and both by seed, sown at the same time, in the open border. Other species formerly included here will be found under **Tolpis.**

C. aurea (golden). *fl.-heads* orange, usually solitary; involucre and stem covered with long black hairs, mixed with a few small white woolly ones. Autumn. *l.* radical, spathulate, oblong, dentate, or runcinate, light green, shining. *h.* 4in. to 12in. Alps.

C. rubra (red).* *fl.-heads* red, usually solitary; involucre hispid, outer bracts scarious. Autumn. *h.* 6in. to 12in. Southern Europe. SYN. *Barkhausia rubra.* See Fig. 543. (S. F. G. 801.)

Crepis—*continued.*

FIG. 543. CREPIS RUBRA, showing Habit, and Single Flower-head (natural size).

CRESCENTIA (named after Pietro Crescenzi, an Italian writer on agriculture, in the thirteenth century, author of "Opus ruralium commodorum"). ORD. *Bignoniaceæ*. Large stove evergreen, spreading trees. Flowers solitary, rising from the trunk or branches; corolla large, sub-campanulate; tube short; throat large, ventricose; limb spreading, five-cleft, unequal; lobes toothed or curled. Leaves alternate, solitary, or in fascicles, simple, entire. They grow well in a mixture of loam, peat, and sand. Ripened cuttings will strike root in sand, under a hand glass, in heat. These trees require to be so large before they reach a flowering state, that it is not likely they will ever be much cultivated in this country. All are natives of tropical America. Some of the species described are: *acuminata*, *cucurbitina*, *Cujete* (Calabash-tree), *macrophylla*, and *obovata*.

CRESCENTIACEÆ. An order now included under *Bignoniaceæ*.

CRESS, AMERICAN or **LAND** (*Barbarea præcox*). This much resembles Water Cress in flavour. Sow monthly from March till September, in rows 1ft. apart, and thin to 4in. or 6in. from plant to plant. Gather the outer leaves only for use; and, in winter, transfer some plants to hand-lights, or protect with bracken or dry litter during frost. The leaves may be used for the same purposes as the common Cress.

CRESS, GARDEN (*Lepidium sativum*). Very popular salading plants, generally grown (and eaten) with Mustard, both requiring very similar treatment. For small salading the common Cress is largely used, and the seed is cheaper than the other kinds. Boxes, from about 1ft. square, and 3in. deep, are most useful for growing it in winter. They should be filled to within ½in. of the top with friable soil, and the seed sown rather thickly, without covering them with soil. The boxes should be covered with panes of glass, and placed, after watering, in a warm house; in from ten to fourteen days, the salad will be fit for use. A succession may be kept up by frequent sowings. Cress can be grown out of doors in summer, either in boxes or sown in a cool place. It should be kept free from soil on the top, or it is difficult to have it without being gritty.

Sorts. Plain or common, the sort used when only the seed leaves are formed; Curled, this is a hardy sort, and, if allowed to grow, the leaves may be used for garnishing as well as salad; Golden or Australian, a dwarf yellowish form, grown the same way as the preceding, but not fit for use so early as common Cress.

CRESS, INDIAN. *See* **Tropæolum.**

CRESS ROCKET. *See* **Vella Pseudo-Cytisus.**

CRESS, WATER (*Nasturtium officinale*). Water Cress is in great demand at all times, excepting in two or three of the summer months, when the plants are flowering and producing their seed. It is a hardy perennial and a native of Britain, where it grows in ditches and small streams. The best quality is obtained from shallow streams of running water, free from mud if possible, as the latter spoils the flavour. Propagation is effected by seed, or by division of

FIG. 544. WATER CRESS (NASTURTIUM OFFICINALE).

the plants. Water Cress (see Fig. 544) may be cultivated in soil if a suitable place cannot be obtained to grow it in water, but the produce is inferior. If required to be grown in the ground, a shady, cool position should be chosen, and the seed sown in spring, in shallow drills, thinning the plants to 6in. when large enough. The soil must be kept constantly moist by watering. In autumn, some plants may be placed in pans, and transferred to a warm house to keep up a supply during winter. The advantages are many if a shallow stream can be obtained. Well-rooted young specimens should be selected; and, when established, the more the tops are gathered, the better, as the plants are thereby induced to produce more. The motion of the water prevents its freezing in winter, consequently the Cress may be gathered at any time. Special shallow ponds, with appliances for drawing all the water off when required, are the best means of cultivation; but such a system cannot, in the majority of cases, be followed. There are two or three forms of Water Cress; but there is not much difference in flavour when grown under the same conditions. The large Brown-leaved is the one most preferred in the market, but the Green-leaved is said to be of the easiest culture.

CREST. Applied to the raised regular or irregular appendage terminating any particular organ.

CRIBROSE. Pierced with holes, like a sieve.

CRICKETS. A group of insects, comprising House Crickets (*Acheta domestica*, see Fig. 545), Field Crickets

FIG. 545. HOUSE CRICKET (GRYLLUS DOMESTICUS).

(*Acheta campestris*), and Mole Crickets (*Gryllotalpa vulgaris*). The Orthoptera, to which the Crickets belong,

Crickets—*continued.*

do not undergo a complete metamorphosis. The female bears an ovipositor, composed of four narrow elastic blades. By means of this, she is enabled to deposit her eggs in the ground, or elsewhere, in the most suitable places. The larvæ, when hatched, differ very little in general appearance from the perfect insect; indeed, they are perfectly formed, except in having no trace of wings. This fact explains how it is that we find, associated together, individuals differing much in size, and but slightly in appearance. The Field Cricket differs from the House Cricket in being somewhat larger, stouter, and darker. It lives in fields or banks, in burrows of considerable depth. If troublesome, it may be caught by pushing a straw into the burrow; the insect usually seizes the intruding body, and may be dragged out by it. To garden plants, the **Mole Cricket** is far more hurtful than the other kinds. Crickets can be destroyed by the methods mentioned for **Cockroaches**. For eradicating both these insects, various preparations are sold. Where poisons would be objectionable, fresh Rhubarb leaves, or oatmeal and salt, will be found useful, as will also Carbolic Acid, poured into their holes.

CRINITA. A synonym of **Pavetta** (which *see*).

CRINODENDRON. *See* **Tricuspidaria.**

CRINONIA. A synonym of **Pholidota** (which *see*).

CRINUM (from *Krinon*, the Greek name for Lily). ORD. *Amaryllideæ*. A large genus of very handsome bulbous plants. Perianth funnel-shaped, half six-cleft, with a long, slender tube, and a six-parted limb of nearly equal segments, which are erect, spreading, or reflexed.

PROPAGATION may be effected by seed, or by offsets. The former are of considerable size, and should be sown singly, as soon as ripe, in 3in. or 4in. pots, the roots, when formed, being so large and succulent. Sow in sandy loam and leaf mould, place in a temperature of from 70deg. to 80deg., and keep rather dry until the plants appear, when more moisture should be applied. As most of the species are partially or entirely evergreen, young plants may be grown on all the season, without much drying off. With plenty of heat and moisture, rapid growth is insured when once they are well started, some soon attaining sizes large enough for flowering. Some species produce offsets pretty freely, while others are very shy in this respect. Where they can be obtained, a great saving of time is effected, as large plants are formed much quicker than by seed. They should be removed when rather small, on account of injury to the roots, and as many roots as possible must be preserved. The young plants should be potted separately, and grown on as recommended for seedlings. Crinums require copious supplies of water at all times when in growth; even young specimens will bear much more than the majority of other bulbs. Being distributed over rather a wide area of tropical and sub-tropical countries, they are of different degrees of hardiness. Some require a high temperature, and a moist position in the stove; others succeed in a greenhouse; and a few are sufficiently hardy to thrive in a sheltered position outside, with protection in winter.

CULTIVATION. The stove and greenhouse species cultivated indoors require large pots or tubs in most cases, as the roots are numerous and fleshy. Those of from 1ft. to 2ft. in diameter will be necessary for flowering bulbs; and, if a suitable compost be used and ample drainage provided, the plants may be shifted into these from much smaller pots without any fear of injury being entertained. It will not be necessary to repot Crinums annually when they reach such a size, if plenty of water is supplied, and a top-dressing of good soil be given when growth commences, in spring. This is also the best season for potting any that require it. Turfy loam, with some fibry peat and charcoal, all broken and used as lumpy as possible, form a good and lasting compost. After potting or top-dressing in spring, Crinums should be started into

Crinum—*continued.*

growth by being placed in stove heat, or in a somewhat cooler, but at the same time close, temperature, according to the requirements of individual species. Frequent syringings should be given, and some liquid manure may occasionally be applied to established plants. The flowers are all very beautiful, and are produced at various times throughout the summer, but more particularly towards the autumn. After flowering, water should be partially withheld for the winter or resting period, and the plants fully exposed to the sun. Crinums are seldom much injured by sunshine, but a slight shading is preferable in summer, when some of the leaves are young and tender.

Outdoor Culture. A rich soil, in a sheltered south border, with plenty of drainage provided, is requisite for success with Crinums in the open air. Deep planting is recommended if they are to remain all the winter, in order that the bulbs may be out of the reach of frost. They should be of a good size before planting out. The best season is the end of May, as time is then afforded for the plants to flower and the roots to become established before winter. They must be kept clean, and watered when necessary. On the appearance of frost, the necks of the bulbs should be protected with haybands or fern; and when the leaves die away, the whole may be covered with cocoa-nut fibre. Where safety cannot thus be insured, on account of locality, it is best to lift and store the bulbs for the winter in a cool house or shed, and plant out again the following May. A stake must be placed to the flower-scape, when it appears, to prevent injury from rough wind. *C. Moorei* is one of the most beautiful species for greenhouse or outdoor cultivation, and is, moreover, almost certain to flower annually after the bulbs are strong enough. *C. asiaticum*, *C. capense*, and *C. Macowani*, amongst others, will also succeed in suitable positions outside.

C. amabile (lovely).* *fl.* twenty to thirty in an umbel, very fragrant; perianth tube bright red, cylindrical, 3in. to 4in. long; segments same length, spreading or revolute; scape 2ft. to 3ft. long, ancipitous. Summer. *l.* 3ft. to 4ft. long, 3in. to 4in. broad, lorate, tapering gradually to a point. Bulb small; neck about 1ft. long. Sumatra, 1810. Stove. (B. M. 1604.)

C. americanum (American). *fl.* three to six in an umbel, very fragrant; perianth tube 4in. to 5in. long; segments lanceolate, 3in. to 4in. long, white on the back; peduncle 1½ft. to 2ft. long. Summer. *l.* six to ten, arcuate, lorate, 2ft. to 3ft. long, 1½in. to 2in. broad. Bulb ovoid; neck short. South United States, 1752. Stove. (B. M. 1034.)

C. amœnum (pleasing). *fl.* six to twelve in an umbel; perianth tube greenish, 3in. to 5in. long; segments spreading, lanceolate, 2in. to 3in. long, pure white; scape 1ft. to 2ft. long. Summer. *l.* rosulate, linear, sub-erect, 1½ft. to 2ft. long, 1in. to 2in. broad. Bulb globose, 2in. to 3in. in diameter. India, 1807. Stove.

C. angustifolium (narrow-leaved). *fl.* five to six in an umbel; perianth tube 3in. to 4in. long; segments lanceolate, 2½in. long, and ½in. broad at the middle; scape about 1ft. long. Summer. *l.* linear, 1½ft. to 2ft. long, 1in. to 1½in. broad. Bulb sub-globose; neck very short. North Australia, 1824. Greenhouse. SYN. *C. arenarium*. (B. M. 2355.) There are two or three forms of this species.

C. aquaticum (aquatic). A synonym of *C. campanulatum*.

C. arenarium (sand-loving). A synonym of *C. angustifolium*.

C. asiaticum (Asiatic).* Asiatic Poison Bulb. *fl.* about twenty in an umbel; perianth tube slender, cylindrical, 3in. to 4in. long, tinged with green; segments white, linear, 2½in. to 3in. long; peduncle ancipitous, 1½ft. to 2ft. long. Bulb 4in. to 5in. in diameter; neck 6in. to 9in. long. Tropical Asia, 1732. Greenhouse. (B. M. 1073.) *C. anomalum*, *C. declinatum* (B. M. 2231), *C. plicatum* (B. M. 2908), *C. procerum* (B. M. 2684), and *C. sinicum*, are mere forms of this species.

C. augustum (august). *fl.* twelve to twenty in an umbel; perianth 3in. to 4in. long, tinged with red; scape lateral, 2ft. to 3ft. long, compressed. April. *l.* twenty to thirty, lorate, 2ft. to 3ft. long, 3in. to 4in. broad. Bulb ovoid, nearly 1ft. high and 6in. in diameter. Mauritius, 1818. Stove. One of the most effective species of the genus. (B. M. 2397.)

C. australe (Southern). A synonym of *C. pedunculatum*.

C. Balfourii (Balfour's).* *fl.* ten to twelve in an umbel, very fragrant; perianth tube greenish, 2in. long; segments pure white, oblanceolate, 2in. long, ½in. broad at the middle; peduncle axillary, compressed, 1½ft. long. October. *l.* ten to twelve, lorate, spreading, about 1ft. long. Bulb 3in. in diameter; neck short. Socotra, 1880. Stove. (B. M. 6570.)

Crinum—*continued.*

C. brachynema (short-filamented). *fl.* fifteen to twenty in an umbel; perianth tube green, 1½in. to 1⅝in. long; limb pure white, 2in. long, with oblanceolate obtuse segments; scape 1ft. long, little compressed. May. *l.* lorate, developed after the flowers, 1½ft. to 2ft. long, 3in. to 3½in. broad. Bulb ovoid, 2½in. to 3in. in diameter. Bombay Presidency, 1840. Stove. (B. M. 5937.)

C. bracteatum (bracteate). *fl.* ten to twenty in an umbel, slightly fragrant; perianth tube tinged with green, 2½in. to 3in. long, segments linear, about as long as the tube; scape about 1ft. long, much compressed. July. *l.* six to eight, 1ft. to 1½ft. long, 3in. to 4in. broad. Bulb ovoid; neck short. Seychelles and Mauritius, 1810. Stove. (B. R. 179.)

C. caffrum (Caffre). A synonym of *C. campanulatum.*

C. campanulatum (bell-shaped). *fl.* five to six in an umbel; tube 1½in. to 2in. long; limb campanulate, 1½in. to 2in. long; segments bright red-purple, oblong, obtuse; peduncles slender, 1ft. long. *l.* linear, 3ft. to 4ft. long, ½in. to 1in. broad. Bulb ovoid. Cape Colony. Stove. SYNS. *C. aquaticum* and *C. caffrum.* (B. M. 2352.)

C. canaliculatum (channelled). A synonym of *C. pedunculatum.*

C. capense (Cape Colony).* *fl.* six to twelve in an umbel; perianth tube 3in. to 4in. long; limb about as long as the tube; segments oblong-acute, flushed with red on the back; scape about 1ft. long. Summer. *l.* about twelve, outer ones spreading, lorate, acuminate, 2ft. to 3ft. long, 2in. to 3in. broad, glaucous; inner ones narrower. Bulb 3in. to 4in. in diameter. Cape of Good Hope, 1752. (Figured under the name of *Amaryllis longifolia* in B. M. 661.) Of this very fine hardy perennial, there are numerous varieties and hybrids.

C. Careyanum (Carey's).* *fl.* four to six in an umbel; perianth tube 3in. to 4in. long; limb horizontal, 3in. to 4in. long, with oblong-lanceolate segments, tinged with red towards the centre; scape 1ft. long, little compressed. Autumn. *l.* eight to ten, lorate, 1ft. to 2ft. long, 2in. to 3in. broad. Bulb globose, 3in. to 4in. in diameter; neck short. Mauritius and Seychelles, 1821. Greenhouse. (B. M. 2466.)

C. cruentum (bloody-flowered).* *fl.* five to seven in an umbel, sub-sessile; tube straight, 7in. to 8in. long; perianth-segments 3in. long, linear, bright red; scape green, ancipitous, 2ft. long, ½in. thick, low down. Summer. *l.* lorate, 3ft. to 4ft. long, 2in. to 4in. broad. Bulbs large. Mexico, 1810. Stove. (B. R. 171.) *C. Loddigesianum* is believed to be identical with this species.

C. defixum (bent down). *fl.* six to sixteen in an umbel; perianth tube greenish or red-tinted, 2½in. to 3in. long; segments linear; scape 1ft. to 1½ft. long. October. *l.* six to eight, linear, 2ft. to 3ft. long, about 1in. broad. Bulb 2in. to 3in. in diameter. India, 1810. Stove. (B. M. 2208.) *C. ensifolium* (B. M. 2301) is probably a variety of this.

C. erubescens (erubescent). *fl.* four to eight in an umbel; perianth tube 5in. to 6in. long; segments half as long, linear-lanceolate, tinted claret-purple on the outside; scape 1½ft. to 2ft. long. Summer. *l.* numerous, lorate, 2ft. to 3ft. long, 2in. to 2½in. broad. Bulb ovoid; neck short. Tropical America, 1780. Stove. (B. M. 1232.) Several varieties of this species have been described.

C. Forbesianum (Forbes's). *fl.* thirty to forty in an umbel, slightly scented; perianth tube 3in. long; limb funnel-shaped, 4in. to 4½in. long; segments oblanceolate-oblong, white, reddish outside; peduncle hardly 1ft. long, stout. October. *l.* ten to twelve to a rosette, lorate, 3ft. to 4ft. long, 3in. to 4in. broad; margin fimbriated. Bulb ovoid, 6in. to 8in. in diameter. Delagoa Bay, 1824. Stove. (B. M. 6545.)

C. giganteum (gigantic).* *fl.* about six in an umbel, with a strong vanilla-like fragrance; perianth tube 4in. to 6in. long; limb campanulate, 3in. to 4in. long, pure white; segments oblong-obtuse, much imbricated; peduncle 2ft. to 3ft. long, compressed. Summer. *l.* lorate, 2ft. to 3ft. long, 3in. to 4in. broad. Bulb 5in. to 6in. in diameter. West Tropical Africa, 1792. Stove. (A. B. R. 169.)

C. Herbertianum (Herbert's). A synonym of *C. zeylanicum.*

C. Kirkii (Kirk's).* *fl.* twelve to fifteen in an umbel; perianth tube greenish, 4in. long; limb horizontal, 5in. long; segments acuminate, above 1in. broad, furnished with a bright red stripe down the back; peduncles sometimes more than one to a bulb, 1ft. to 1½ft. long, ancipitous. September. *l.* lorate, acuminate, 3½ft. to 4ft. long, 4in. to 4½in. broad; margin crisped, white, distinctly ciliated. Bulb globose, 6in. to 8in. in diameter. Zanzibar, 1879. Stove. (B. M. 6512.)

C. latifolium (broad-leaved). *fl.* ten to twenty in an umbel; perianth tube greenish, 3in. to 4in. long; limb horizontal, about as long as the tube; segments oblong-lanceolate, faintly tinged with red in the centre on both sides, reflexing at tip; peduncles 1ft. to 2ft. long. Summer. *l.* numerous, lorate, 2ft. to 3ft. long, 3in. to 4in. broad. Bulb sub-globose. India, 1806. Stove. (B. R. 1297.) *C. insigne* (B. R. 579), *C. moluccanum* (B. M. 2292), and *C. speciosum* (B. M. 2217), are considered by Mr. Baker to be mere varieties of this species.

C. longiflorum (long-flowered). *fl.* six to eight in an umbel; perianth tube 3in. to 4in. long; limb funnel-shaped, as long as the tube; segments oblong, flushed with pink in the centre; peduncle

Crinum—*continued.*

1½ft. to 2ft. long. Summer. *l.* lorate, 4ft. to 5ft. long, 2in. broad. Bulb ovoid, 3in. to 4in. in diameter. Cape of Good Hope, 1816. Greenhouse, or nearly hardy. See Fig. 546. (B. R. 303.)

FIG. 546. CRINUM LONGIFLORUM, showing Habit and Single Flower.

C. longifolium (long-leaved). *fl.* six to twelve in an umbel; perianth tube greenish, 3in. to 4in. long; segments lanceolate, ascending, white, nearly as long as the tube; scape lateral, about 1ft. long. *l.* six to eight, linear, 1½ft. to 2ft. long, 1½in. to 2in. broad. Bulb ovoid, 4in. to 5in. in diameter. India. Greenhouse. (B. R. 1297.) *C. elegans* (B. M. 2592) is a form of this species.

C. Macowani (MacOwan's).* *fl.* ten to fifteen in an umbel; perianth tube greenish, 3in. to 4in. long; segments oblong, acute, as long as the tube, 1in. to 1¾in. broad, white, with a purplish tinge; peduncles sometimes more than one, 2ft. to 3ft. long. November. *l.* twelve to fifteen, rosulate, spreading, lorate, 2ft. to 3ft. long, 3in. to 4in. broad. Bulb 9in. to 10in. in diameter. Natal, 1874. Greenhouse, or nearly hardy. (B. M. 6381.)

C. Makoyanum (Makoy's). A synonym of *C. Moorei.*

C. Moorei (Moore's).* *fl.* six to ten in an umbel; perianth tube greenish, 3in. to 4in. long; limb funnel-shaped, as long as the tube; segments oblong-acute, faintly flushed with red; peduncles 1½ft. to 2ft. long. Spring or autumn. *l.* twelve to fifteen, spreading, lorate, 2ft. to 3ft. long, 3in. to 4in. broad. Bulb ovoid, 6in. in diameter. Natal, 1874. Greenhouse. SYNS. *C. ornatum* and *C. Makoyanum.* (B. M. 6113.)

C. ornatum (ornamented). A synonym of *C. Moorei.*

C. pedunculatum (pedunculate). *fl.* twenty to thirty in an umbel; perianth tube greenish, 2½in. to 3in. long; segments linear, spreading horizontally; scape ancipitous, 2ft. to 3ft. long. Summer. *l.* twenty, lorate, 3ft. to 4ft. long, 4in. to 5in. broad. Bulb about 4in. in diameter. Eastern Australia, 1790. Greenhouse. SYNS. *C. australe* and *C. canaliculatum.* (B. R. 52.)

C. podophyllum (foot-leaved). *fl.* two in an umbel; tube greenish, 5in. to 6in. long; limb sub-erect, 3in. long; segments oblong-spathulate, acute, less than 1in. broad, white; scape compressed, 8in. to 9in. long. November. *l.* five to six, lanceolate, 1ft. long, 1½in. to 2in. broad at the middle. Bulb sub-globose. Old Calabar, 1879. Stove. (B. M. 6483.)

C. purpurascens (purplish).* *fl.* five to nine in an umbel; perianth tube 5in. to 6in. long; segments lanceolate, 2½in. to 3in. long, spreading, tinted claret-red on the outside; scape hardly 1ft. long, sub-terete. Summer. *l.* about twenty, linear, 1½ft. to 3ft. long, 1in. broad, undulated. Bulb ovoid, about 2in. in diameter. Fernando Po and Old Calabar, 1826. Stove. (B. M. 6525.)

C. scabrum (rough). *fl.* six to eight in an umbel, very fragrant; tube greenish, 4in. to 5in. long; limb funnel-shaped; segments oblong-acute, 1in. broad, bright red down the back; scape compressed, 1ft. to 2ft. long. May. *l.* lorate, 3ft. to 5ft. long, 2in. to 2½in. broad. Bulb large. Probably Africa, 1810. Stove. (B. M. 2180.) *C. submersum* (B. M. 2463) is a form of this species.

C. zeylanicum (Cingalese).* *fl.* ten to twenty in an umbel, very fragrant; perianth tube green, or red-tinted, about 3in. to 4in. long; limb horizontal, about the same length; segments 1in. broad, with a broad band of red down the back; scape 2ft. to 3ft. long. Early spring. *l.* six to ten, lorate, 2ft. to 3ft. long, 3in. to 4in. broad. Bulb globose, 6in. in diameter. Tropical Asia and Africa, 1771. Stove. SYN. *C. Herbertianum.* (B. M. 1171; and B. M. 1253, under name of *Amaryllis ornata.*)

CRIOCERIS ASPARAGI. *See* **Asparagus Beetle.**

CRIOCERIS MERDIGERA. *See* **Lily Beetle.**

CRISTARIA (from *crista*, a crest; in reference to the carpels having two crest-like rings in the centre of each). ORD. *Malvaceæ*. A genus of about twenty species of generally prostrate, tomentose herbs, all natives of extra-tropical South America. Probably there are none in cultivation in this country, although most of the species are well worth growing.

C. coccinea. *See* **Malvastrum coccineum.**

CRITHMUM (from *krithe*, Barley; in allusion to the similarity existing in the seed). Samphire. ORD. *Umbelliferæ*. A suffruticose, glabrous, fleshy herb. Umbels compound; involucre and involucels of many leaves. Leaves bipinnate; leaflets oblong, linear; petioles sheathing at the base. Samphire grows best in a warm, dry position, near the sea coast. When grown inland, it requires a sunny situation, and protection during the winter. It may be propagated by divisions, or by seeds; the latter should be sown as soon as ripe, as, if kept till spring, they are longer in germinating.

C. maritimum (maritime). *fl.* white, with yellowish anthers. August. *h.* 1ft. Britain. (Sy. En. B. 606.)

CROCKING. A term applied to the placing of a piece of potsherd over the hole at the bottom of a pot.

CROCOSMIA (from *crocus*, saffron, and *osme*, smell; in allusion to the very pronounced odour of saffron exhaled by the dried flowers of this plant when immersed in warm water). ORD. *Irideæ*. A monotypic genus, generally known as *Tritonia*. The species is a very handsome hardy, or nearly hardy, bulbous perennial, and thrives best in a light, rich, sandy soil. It is often grown in pots for the greenhouse; but, with a little care, it will be found to thrive remarkably well in the open. In cold, northerly situations, the better plan will be to lift the roots in November, and store in frost-proof quarters until the following spring; but they must not be kept so dry as to cause them to shrivel. Propagated by offsets, or by seeds; the latter should be sown in pans, in a cold house, as soon as possible after maturity; but where the Crocosmia does well, the corms increase pretty freely.

C. aurea (golden).* *fl.* brilliant orange-red, few; perianth with a longish curved slender tube, and a nearly regular six-parted limb of oblong segments spreading in a star-like form; spike terminal, branched. Summer and autumn. *l.* narrowly sword-shaped, 1ft. long, ¾in. broad, sheathing at the base of the stem for about 1ft. Stem slightly winged. *h.* 2ft. South Africa, 1846. SYN. *Tritonia aurea*. (B. M. 4335.)

CROCUS (a Chaldean name, applied by Theophrastus). ORD. *Irideæ*. A well-known genus of hardy bulbous plants. Scapes enveloped in a thin tubular sheath; perianth regular, consisting of six (generally) nearly equal segments, and with a long slender tube. Leaves slender, narrow, linear, channelled, with recurved margins; developing after the blossoms have faded, or simultaneously with them. Corms fleshy, with sheathing fibrous coats. This genus contains about seventy species, and is confined to Europe, North Africa, and North and West Asia. It is generally represented in our gardens by about a dozen species, and the innumerable varieties of *C. vernus*. As a great many that enjoy undisputed claims to specific rank are by no means distinct enough in general appearance to arrest the attention of any but specialists, the enumeration of species is confined to those which are in more general cultivation. For full account and descriptions of all the known species, the reader should consult Mr. Maw's "Synopsis," published in the "Gardeners' Chronicle," n. s., vol. xvi.

Some of the species flower in the autumn as freely as, and in a similar way to what, the majority of other species and nearly all the numerous cultivated varieties flower in spring. *C. speciosus* may be mentioned as one of the best. Those, however, which flower from December to January, are so very liable to be injured by severe frosts, that it is better to afford them the shelter of a cold frame.

Crocus—*continued.*

PROPAGATION. This is effected by seed, for raising new varieties; and the increase of the corms perpetuates established species and forms. Each year, one, or in some cases, several young corms are formed, either on the top or by the side of the old one, the latter annually dying away. For increasing stock, these may be lifted and replanted singly, allowing sufficient room for each in its turn to develop new corms the following year. More would be obtained of varieties that increase rapidly, by this method, than if they were left crowded together. Some species increase very slowly, and these, with many that are scarce and valuable, are best left undisturbed, so long as they grow satisfactorily.

Seed. The seed of the Crocus should be sown as soon as ripe, or early in spring, the choicer strains in pots or boxes, using a light sandy soil, and afterwards placing them in a cold pit or frame, while the commoner varieties may be placed in a warm position outside, in a seed-bed. The seed germinates freely, and must be sown thinly, so as to allow the plants space to grow for two seasons in the seed-pan or bed, without lifting. They will need but little attention beyond being occasionally weeded and watered. After the second year, when the corms die down, they should be shaken out, and replanted. In the third or fourth year, most of them will flower, and any good ones may then be selected. It is an excellent plan to top-dress the seed-beds or pans, after the first season, with an inch or two of rich compost.

CULTIVATION. Many of the species thrive on rockwork, in soil that has a good proportion of small stones intermixed, thereby insuring thorough drainage. If planted deeply and permanently in such a position, dwarf-growing plants, such as mossy Saxifrages, may be placed above, and the Crocuses allowed to grow through, when flowering. It is difficult to keep a collection separate and distinct, if planted near each other. The corms, by their mode of propagation underground, gradually become removed to a considerable distance from where they were first placed; and, if other species are near, the whole soon become mixed. The remedy is to lift and replant, or make a limited inclosure for each with slates, placed on edge in the ground. It is not necessary to lift often for any other purpose. As soon as the leaves are ripened, and die away, is the best time for lifting, if it is required. Sandy loam, with the addition of some leaf soil and sharp grit or crushed stones, is a good compost; and it is preferable to prepare this and replant at once. The ordinary varieties of spring-flowering Crocuses, so much cultivated, will grow and flower freely in almost any soil or position. They are very largely imported from Holland, in the autumn of each year; and the quicker planting is taken in hand, after their arrival, the better. The margins of flower-beds, planted with other bulbs, or of borders running parallel with a walk, are positions, among innumerable others, that may be rendered attractive by a mass of differently-coloured Crocuses. The corms can be inserted most regularly in a small trench, about 3in. deep, placing them a similar distance apart. The leaves should be left alone after flowering is over until they ripen, and the corms need not be lifted unless the place is required for other plants in summer. In this case, they may be transplanted, and allowed to ripen elsewhere.

Cultivation in Pots. Spring Crocuses are useful and very ornamental when flowering in pots. The imported roots may be bought cheaply in autumn, and their cultivation is within the reach of all. Place five or six corms in a 5in. pot, or four in a smaller one, and bury them in ashes outside for a time until filled with roots, when they should be very gradually brought on in a cool pit or house. The Crocus will not flower if exposed to fire heat, nor must severe forcing be attempted. If placed in a light position, with a little higher temperature than that outside, each corm will produce several flowers earlier than those planted

Crocus—*continued.*

in the open. The individual flowers do not last long, but there is a succession which extends the season over a considerable period. The stronger-growing sorts succeed well in water if treated like Hyacinths.

C. alatavicus (Alatavian). *fl.* white, small, with a yellow glabrous throat, and without a basal spathe; outer surface of the three outer segments obscurely feathered and freckled with purple. February. *l.* 1ft. long at maturity, $\frac{1}{16}$in. broad, slightly ciliated at margins of keel and blade. Ala Tau Mountains, 1877. There is a white-flowered variety, in which the outsides of the outer segments are coated with pale buff.

C. aureus (golden).* *fl.* bright orange. Spring. *l.* linear; sheaths wide. Corm, coat membranous, with vertical, narrow, fibroid divisions. South-east Europe. This "was one of the first species introduced to cultivation, and is the parent of our yellow garden, or 'Dutch Yellow,' Crocus, and a number of old horticultural varieties—*lacteus*, *sulphureus*, *sulphureus pallidus*, *sulphureus striatus*, &c.—the history of which is unknown; they are not known to occur in a wild state, and all are sterile." SYNS. *C. lagenæflorus*, *C. mæsiacus*, &c.

C. biflorus (two-flowered).* *fl.*, segments of perianth varying from white to a pale lavender; outer surface of the outer segments distinctly feathered with purple markings; yellow within. Spring. *l.* short, erect, narrow, with distinct white midrib. This species has a wider range than any other (extending from Tuscany into Georgia), and none exhibits greater variation in the size and colouring of the flowers. (B. M. 845.) *C. Adami* (B. M. 3868), *C. estriatus*, *C. minimus* (B. M. 2991), *C. nubigenus*, and *C. Weldeni* (B. M. 6211), among many others, are forms of this species.

FIG. 547. CROCUS BORYI.

C. Boryi (Bory's).* *fl.* creamy-white; throat orange-yellow; base of segments marked externally with dull purple lines. Late autumn. *l.* narrow, smooth, produced a little before the flowers. *h.* 3in. to 4in. Greek Isles. See Fig. 547. (B. R. 1847, 16.)

C. byzantinus (Byzantine). A synonym of *C. iridiflorus*.

C. Cartwrightianus (Cartwright's). A miniature form of *C. sativus*. SYN. *C. græcus*.

C. chrysanthus (golden-flowered). *fl.* rich orange-yellow; perianth segments obovate. Very early spring. South-eastern Europe. There are four varieties of this species: *albidus*, *cærulescens*, *fusco-tinctus*, and *fusco-lineatus*.

C. fimbriatus (fimbriated). A synonym of *C. nudiflorus*.

C. fragrans (fragrant). A synonym of *C. versicolor*.

C. græcus (Greek). A synonym of *C. Cartwrightianus*.

C. Imperati (Imperato's).* *fl.* of a lilac-purple on the inside, sweet-scented; "external divisions 1¾in. long and ¾in. broad, marked with three longitudinal dark purple lines, of which the two outer ones and the end of the middle one are feathered with short lines of the same colour." Very early spring. *l.* preceding the flowers, linear, thick, recurved, with a distinct white line in the middle, sheathed for 2in. or 3in. at base. *h.* 3in. to 6in. Italy. (B. R. 1993.)

FIG. 548. CROCUS IRIDIFLORUS.

C. iridiflorus (Iris-flowered).* *fl.*, perianth throat unbearded; outer segments clear, rich purple, much larger than the inner ones, which are pale lilac; anthers orange, shorter than the stigmata; filaments lilac; stigmata purple, multifid. September and October. *l.*, proper ones glabrous, ⅛in. wide, wider than in any other strains; sheathing leaves falling short of proper spathe; proper spathe monophyllous, foliaceous. Corm small, oblate; tunic fibro-membranous, tending to a reticulated structure. Banat and Transylvania. SYN. *C. byzantinus*. See Fig. 548. (B. M. 6141.)

C. lagenæflorus (bottle-flowered). A synonym of *C. aureus*.

C. mæsiacus (Mæsian). A synonym of *C. aureus*.

C. multifidus (much-cut). A synonym of *C. nudiflorus*.

FIG. 549. CROCUS NUDIFLORUS.

C. nudiflorus (naked-flowered).* *fl.* pale bright purple or violet; tube 3in. to 10in. long, and segments 1¼in. to 2in. long; throat not hairy. Autumn. *l.* about ½in. broad, appearing in spring. The corms produce long stolon-like shoots, which form independent corms at the death of the parent. South-west Europe; naturalised in meadows about Nottingham and elsewhere in England. SYNS. *C. fimbriatus*, *C. multifidus*, and *C. pyrenæus*. See Fig. 549. (Sy. En. B. 1500.)

C. Orphanidis (Orphanides'). A synonym of *C. Tournefortii*.

C. pulchellus (beautiful). *fl.* pale bluish-pearl colour, with darker veins, large; throat orange-yellow. Autumn. *l.* $\frac{3}{16}$in. broad, smooth, with a prominent narrow keel. *h.* 4in. to 5in. Shores of the Bosphorus, &c. (B. R. 30, 3.)

C. pyrenæus (Pyrenean). A synonym of *C. nudiflorus*.

C. reticulatus (netted). *fl.* varying from white to deep lilac, the outer face of the outer segments feathered with purple; throat

Crocus—*continued.*

glabrous. *l.* $\frac{1}{16}$in. broad, the lateral channels containing one or two ribs.

C. revolutus (revolute). A synonym of *C. susianus.*

FIG. 550. CROCUS SATIVUS.

C. sativus (cultivated). Saffron Crocus. *fl.* violet, variously striped and marked with deeper or lighter tints, fragrant; throat hairy. Autumn. *l.* $\frac{1}{8}$in. broad, ciliated; margins of blade and keel ciliated. Corm rather large, globular, depressed. From Italy to Kurdistan. This species furnishes the saffron of commerce. It appears to have been cultivated in Palestine at the time of Solomon. See Fig. 550. (B. M. Pl. 274.) The following plants, which have been accorded specific rank, are all referable to *C. sativus* as mere forms: *C. Cartwrightianus, C. Elwesii, C. Haussknechtii, C. Orsinii, C. Pallasii* (SYNS. *C. Thomasii* and *C. hybernus*).

C. Sieberi (Sieber's). *fl.*, throat orange, unbearded; perianth a uniform bright lilac, with a rich golden base; anthers orange; stigmata orange-scarlet. February and March. *l.* glabrous, 4in. broad, with open, unribbed, lateral channels. *h.* 2in. to 3in. Greece, &c.

C. S. versicolor (various-coloured). *fl.* varying from white to purple, and with white and purple stripings and featherings, but always with a rich golden base. Crete and the Cyclades.

C. speciosus (showy).* *fl.* bright lilac, internally striped with deep purple lines, large; stigmata orange, conspicuously fringed. Autumn. *l.* $\frac{1}{2}$in to $\frac{1}{4}$in. broad, with prominent keel, erect, appearing almost with the flowers. Corms nearly round. East Europe and West Asia. Probably the handsomest of autumnal-flowering kinds. (B. M. 3861.)

C. susianus (Susian).* Cloth of Gold Crocus. *fl.*, perianth throat glabrous; segments about 1$\frac{1}{2}$in. long and $\frac{1}{2}$in. broad, reflexed, deep orange, the outer face of outer segments variously feathered with deep brown, occasionally self-coloured orange, or evenly suffused with dull brown; anthers orange, about twice the length of the orange filament; the style dividing at the base of the anthers, and produced into long, spreading, entire, orange-scarlet stigmata, which much exceed the anthers. February. *l.*, proper ones reaching to the flowers, the margins of keel and blade ciliated; sheathing leaves falling short of the proper spathe; proper spathe diphyllous. Corm about $\frac{3}{4}$in. broad; tunic of strong reticulated fibre, with long interspaces produced upwards into sharp, wiry points. *h.* 3in. Crimea and Caucasus, 1605. This is one of the earliest spring-flowering species. SYN. *C. revolutus.*

C. Tournefortii (Tournefort's). *fl.* lilac, uniform, bright, with a few purple veins, 2$\frac{1}{2}$in. in diameter; throat orange. Autumn. *l.* appearing with the flowers. Corms large, nearly 2in. long, closely covered with a soft brown membrane. The Cyclades and the Morea. SYN. *C. Orphanidis.* (B. M. 5776.)

FIG. 551. CROCUS VERNUS.

Crocus—*continued.*

C. vernus (spring).* *fl.* lilac, violet, white (never yellow), or streaked with white and violet; inside of the throat always hairy. Spring. *l.* $\frac{1}{2}$in. broad, rarely glabrous; lateral channels wide and open, without ribs, appearing with the flowers. Corm invested with slender anastomosing fibres. Europe. This species was one of the earliest introduced to cultivation, and has become naturalised in several localities in Britain. It is remarkable for the great range of the colouring of its flowers; the endless varieties, from pure white to deep purple, being generally intermixed in its native habitats, and corresponding with the multitude of horticultural varieties which decorate our gardens. See Fig. 551.

FIG. 552. CROCUS VERSICOLOR.

C. versicolor (various-coloured).* *fl.*, perianth throat glabrous; segments about 1$\frac{1}{2}$in. long, varying from purple to white, self-coloured, or externally feathered or veined with purple; the inner and outer segments are nearly similar in their markings; anthers yellow, twice the length of the white, slightly glandular filament; style dividing near the summit of the anthers, and produced into entire orange stigmata, which are not divergent. Spring. *l.*, proper ones glabrous, reaching to the throat at the flowering time, about $\frac{1}{2}$in. broad, and 8in. or 9in. long at maturity, the lateral channels containing two or three ribs; sheathing leaves falling short of the proper spathe; proper spathe monophyllous. Corm pyriform, $\frac{3}{4}$in. wide; tunic of parallel fibres. Maritime Alps. This was one of the earliest species introduced, and, from its tendency to vary in colour and markings, has given rise to a host of horticultural varieties. SYN. *C. fragrans.* See Fig. 552. (B. M. 1110.)

VARIETIES. The following are amongst the best to be obtained, either for pots, or for flower garden decoration in spring:

ALBION STRIPED, white, striped mauve, large and early; ARGUS, blue and white; CAROLINE CHISHOLM, pure white, dwarf; CLOTH OF SILVER, white, striped purple; DAVID RIZZIO, purple, very fine; GENERAL GARIBALDI, dark purple, large and good; GOLDEN YELLOW, extra large and good; MONT BLANC, large, pure white, one of the best; PRINCE ALBERT, fine dark blue; QUEEN VICTORIA, white; SIR JOHN FRANKLIN, dark purple, large; SIR WALTER SCOTT, white, striped lilac, fine.

CROSSANDRA (from *krossos*, a fringe, and *aner, andros*, a male; the anthers are fringed). SYNS. *Harrachia* and *Polythrix.* ORD. *Acanthaceæ.* Beautiful evergreen free-flowering stove shrubs. Flowers large, in terminal four-cornered spikes, with broad bracts and narrow bracteoles; corolla with a long tube, and a flat five-cleft limb. Leaves sub-entire, verticillate. There are five species, one of which is a native of the East Indies; the others are from tropical Africa and Madagascar. All are of easy culture in peat and loam. They may be readily propagated by cuttings, which root freely, at almost any time of the year, if planted in sand, and placed in bottom heat.

C. guineensis (Guinea).* *fl.* pale lilac; spike solitary, sessile, 3in. to 4in. high, striate; apex pungent, many-flowered; bracts many pairs, $\frac{1}{2}$in. to $\frac{3}{4}$in. long, imbricated, lanceolate, green. October. *l.* two to four pairs, shortly petioled, 3in. to 5in. long, elliptic, sometimes obovate or oblong, deep green above, with golden reticulated nerves, reddish beneath, with pubescent midrib and nerves. Stem 2in. to 6in. high, erect, rarely branched, light red, covered with a furfuraceous pubescence. Western tropical Africa, 1877. (B. M. 6346.)

C. infundibuliformis (funnel-shaped). A synonym of *C. undulæfolia.*

C. undulæfolia (waved-leaved). *fl.* of a rich reddish-orange, very distinct and attractive, disposed in freely-produced compact

Crossandra—*continued.*

spikes. *l.* stalked, ovate-acuminate, much narrowed to the base; margin wavy. *h.* 1ft. to 3ft. East Indies, 1881. A very ornamental erect-growing stove plant. SYN. *C. infundibuliformis.* See Fig. 553, for which we are indebted to Mr. Bull.

CROSS BEARER. *See* **Asparagus Beetle.**

Crotalaria—*continued.*

species of stove or greenhouse sub-shrubs or herbaceous plants, widely dispersed over all warm regions. Flowers mostly yellow, with small bracts along the pedicels, or at the base of the calyx. Leaves simple or digitately compound; these latter are usually trifoliolate, rarely five to

FIG. 553. CROSSANDRA UNDULÆFOLIA.

CROSSWORT. *See* **Crucianella.**

CROTALARIA (from *krotalon*, a castanet; the pods are inflated, and, when they are shaken, the seeds rattle). ORD. *Leguminosæ.* A large genus containing more than 200 seven-foliolate. Many species blossom freely, and are very handsome when in flower; but few of those cited by Johnson and Paxton are now to be found in cultivation. All thrive well in any light, rich soil. Young cuttings

Crotalaria—*continued.*

of the shrubby kinds root freely in a pot of sand, with a bell glass placed over them, in a cool house. Seeds, however, usually ripen in abundance; these should be sown on a hotbed, in spring, and, when the seedlings have attained a height of 2in. or 3in., they may be placed separately in pots, and some may be planted out in the open border, in summer, especially those from the outskirts of the tropics. Crotalarias are very liable to the attacks of red spider.

C. cajanifolia (Cajanus-leaved).* *fl.*, racemes many-flowered, almost terminal; calyces clothed with appressed pubescence. July. *l.* trifoliate; leaflets oblong, obtuse, mucronate, cuneated at the base, glabrous above, puberulous beneath, and canescent. *h.* 4ft. to 6ft. Mexico, 1824. Greenhouse shrub.

C. Cunninghamii (Cunningham's).* *fl.* yellow-green, marked with purple lines on the reflexed standard, large, disposed in dense racemes. Summer. *l.* ovate, obtuse. *h.* 3ft. Native of the dry, almost desert regions of North-west and Central Australia, 1869. This is a remarkable looking greenhouse shrub, clothed throughout with velvety, glaucous pubescence. (B. M. 5770.)

C. Heyneana (Heyne's). *fl.* white, blue. *l.* one-foliolate. *h.* 1ft. to 2ft. Malabar, 1868. (B. M. 5974.)

C. juncea (Rush-like).* *fl.* yellow; racemes terminal. June. *l.* lanceolate, on short petioles, clothed with appressed pubescence, as well as the furrowed stems. *h.* 4ft. to 8ft. India, 1700. Stove annual. (B. M. 490.)

C. nana (dwarf). *fl.* yellow; peduncles opposite the leaves, three-flowered; calyx pilose. *l.* oblong, nearly sessile, glabrous, obtuse, mucronate. Plant diffuse. India, &c. Stove annual.

CROTON (from *kroton*, a tick; referring to the appearance of the seeds). SYN. *Tiglium.* ORD. *Euphorbiaceæ.* A large genus (about 500 species) of trees and shrubs—rarely herbs—differing widely in habit and general aspect, dispersed all over the warmer parts of the world. Male flowers: calyx cylindrical, five-toothed; petals five; stamens ten to fifteen. Female flowers: calyx many-leaved; corolla none; styles three, bifid; capsules three-celled. None are worth cultivating as garden plants. Several, however, are very important from an economic standpoint. *C. Tiglium*, from the Indian Archipelago, &c., yields Croton oil, one of the most drastic cathartics known. *C. Eluteria* furnishes the Cascarilla bark, also used in medicine. Others yield resins, &c. *See* **Codiæum**, under which genus will be found included the large class of plants popularly known as *Crotons.*

CROWBERRY. *See* **Empetrum nigrum.**

CROWEA (named after James Crowe, of Norwich, a British botanist, and a great collector of Willows). ORD. *Rutaceæ.* Greenhouse evergreen shrubs. Peduncles axillary, one-flowered, furnished with minute imbricate bracts at their base. Leaves alternate, quite entire, lanceolate, running down the stem a little at the base, and full of pellucid dots. Branches triquetrous. Croweas are very useful as decorative plants, and, if grown in a cool place, they form elegant and striking additions to a select collection. They require a light airy situation, which must be free from draughts, and, being hard-wooded subjects, great care will be needed in watering. The soil best adapted is two parts peat and one of fibrous loam, with a small quantity of sand added. Cuttings will strike, with a gentle bottom heat, in sand, under a hand glass. To keep Croweas short and bushy, the tops should be taken off soon after the cuttings have rooted, which will cause the lateral shoots to push earlier and stronger, than they would if left alone. Croweas do not succeed well on own roots; they should be grafted on Correas or Eriostemons.

C. angustifolia (narrow-leaved).* *fl.* red, shortly stalked, solitary or rarely two together. *l.* sessile, linear, mostly acute. *h.* 1ft. to 3ft. West Australia.

C. latifolia (broad-leaved). A synonym of *C. saligna.*

C. saligna (Willow-like).* *fl.* clear pink. Summer. *l.* lanceolate. *h.* 1ft. to 2ft. New South Wales, 1790. SYN. *C. latifolia.* (B. M. 989.) The plants sometimes met with under the names of *elliptica*, *major*, and *stricta*, are probably varieties of this species.

CROWFOOT. *See* **Ranunculus.**

CROWN BEARD. *See* **Verbesina.**

CRUCIANELLA (diminutive of *crux*, a cross; in allusion to the leaves being placed crosswise). Crosswort. ORD. *Rubiaceæ.* Annual or perennial (mostly) hardy herbaceous plants. Flowers hermaphrodite, spicate or fasciculate, bracteate, or ebracteate; corolla tubular, elongated, funnel-shaped. Leaves whorled, with from four to a considerable number in each whorl, linear or lanceolate. The annual species are not worth growing. The perennials are very pretty plants, of easy cultivation in ordinary garden soil; they are readily increased by seeds, or by divisions, during spring or autumn. There are about twenty-six species, confined to the Mediterranean region and Western Asia.

C. glauca (glaucous). *fl.* yellow, remotely spicate; bracts and floral leaves ovate, ciliated. July. *l.* four in a whorl, linear, mucronate, with prickly revolute edges. Stems erectish, branched. Persia, 1837. Perennial.

C. maritima (maritime). *fl.* cream-coloured, axillary, disposed in interrupted spikes. July and August. *l.* four in a whorl, lanceolate, stiff, marginate, mucronate. Mediterranean region, 1640. Plant suffruticose, procumbent, much branched, glaucous, glabrous. Perennial.

C. suaveolens (sweet-smelling). *fl.* yellow, opposite, disposed in dense spikes; floral leaves and bracts lanceolate, ciliated, a little shorter than the corollas. July. *l.* linear, mucronate, with prickly revolute edges, six or eight in a whorl. Stem herbaceous, erect, branched. West Asia, &c., 1838. Perennial.

CRUCIATE, or CRUCIFORM. Shaped like a cross. A flower is said to be cruciate when four petals are placed opposite each other at right angles, as in the Cabbage.

CRUCIFERÆ. A large and important order of annual, biennial, or perennial herbs, rarely suffruticose. Flowers racemed; sepals four, the two lateral ones often larger and saccate at the base, imbricate in bud; petals four, placed crosswise, imbricate in bud; stamens six (rarely one, two, or four), hypogynous, the two outer opposite the lateral sepals, the four inner longer, in pairs opposite the other sepals. Fruit a long or short two-celled and two-valved capsule (rarely indehiscent). Leaves radical or alternate, exstipulate. The order, sometimes called *Brassicaceæ*, comprises about 170 genera and about 1200 species; they are distributed over all temperate and cold regions, but chiefly belong to the Old World. All are nitrogenous (and contain sulphur), pungent, stimulant, anti-scorbutic, often acrid. Many of them are highly-esteemed plants, such as the Broccoli, Cabbage, Cress, Turnip, &c. The following are some of the best-known genera: *Arabis*, *Brassica*, *Cheiranthus*, and *Hesperis.*

CRYPTANTHUS (from *krypto*, to hide, and *anthos*, a flower; the flowers are nearly buried among the bracts). SYN. *Pholidophyllum.* ORD. *Bromeliaceæ.* A genus of stove perennials, epiphytal in a wild state. For culture, &c., *see* **Billbergia.**

C. acaulis (stemless). *fl.* white, in a central, sub-sessile cluster. *l.* lanceolate, wavy, recurved, dark green, scaly. Brazil, 1826. Plant dwarf, cæspitose. SYN. *Tillandsia acaulis.* (B. R. 1157.)

C. bivittatus (two-striped). *fl.* white. *l.* spreading, recurved, about 9in. long and 1in. to 1½in. broad, rather undulate, acutely toothed at the margin; under surface dull brown, upper green, with two broad buff longitudinal bands, which pass into dull red at the base of the leaf. Tropical America, 1859. SYN. *Billbergia bivittata.* (B. M. 5270.)

CRYPTOCHILUS (from *kryptos*, hidden, and *cheilos*, a lip; the lip being partly hidden by the sepals). ORD. *Orchideæ.* A genus containing a couple of species of very interesting stove epiphytal orchids, allied to **Trichosma** (which *see* for cultivation).

C. sanguinea (blood-coloured). *fl.* brilliant scarlet, disposed in a terminal erect raceme; sepals cohering in a tube three-lobed at the top, and inclosing the petals and lip. Summer. Pseudo-bulbs clustered, spheroidal, one or two-leaved. Nepaul, about 1837. (B. R. 1838, 23.)

CRYPTOCORYNE (from *kryptos*, hidden, and *koryne*, a club; the club-shaped spadix is hidden by the spathe peculiar to this family). ORD. *Aroideæ* (*Araceæ*).

Cryptocoryne—*continued.*

Stove herbaceous perennials, requiring treatment similar to the tender species of **Arum** (which *see*).

C. ciliata (hair-fringed).* *fl.* sweet-scented; spathe pedunculate, long, tubular, fringed at top. June. *l.* entire, petiolate, oblong, linear-lanceolate. *h.* 1ft. East Indies, 1823.

C. spiralis (spiral). *fl.* brown. May. *h.* 1ft. East Indies, 1816. SYN. *Arum spirale.* (B. M. 2220.)

CRYPTOGRAMME (from *kryptos*, hidden, and *gramme*, writing; in allusion to the concealed sori). Mountain Parsley Fern; Rock-Brake. ORD. *Filices.* A monotypic genus of hardy Ferns; the only species, although

FIG. 554. CRYPTOGRAMME CRISPA.

comparatively rare and local, is frequently found in stony situations in the North of England and Wales. Sterile and fertile fronds usually different from the same root; Sori terminal on the veins, at first separate, sub-globose,

FIG. 555. CRYPTOGRAMME CRISPA ACROSTICHOIDES.

afterwards confluent, the continuous involucre formed of the changed margin of the frond, rolled over them till full maturity. It is of easy culture in pots or Wardian cases, but requires perfect drainage. *Allosorus*, formerly regularly used for the name of this genus, and even at present regarded as such in some books, is now restricted to a section of the genus *Pellæa*. *See also* **Ferns.**

C. crispa (crisped).* *sti.* tufted, slightly scaly towards the base. *fronds* 2in. to 4in. long, 1½in. to 2in. broad, oblong, tri- or quadri-

Cryptogramme—*continued.*

pinnate; ultimate segments of the barren frond obovate-cuneate, deeply pinnatifid, those of the fertile frond pod-shaped, ⅛in. to ¼in. long. Arctic and North temperate regions (Great Britain) SYN. *Allosorus crispus.* See Fig. 554.

C. c. acrostichoides (Acrostichum-like).* Habit larger and stronger than in type; barren segments thicker in texture, more prominently veined, and not so deeply cut; fertile ones ⅛in. to ½in. long, one line broad; involucre spreading when mature. North-west America. See Fig. 555.

C. c. Brunoniana (Brown's). Habit of type, but the fertile segments oblong, about three lines long, one line broad, with the involucre spreading in the mature plant, and a space left free from fruit in the centre.

CRYPTOMERIA (from *kryptos*, hidden, and *meris*, part; referring to the structure of all the parts of the flower being hidden). Japan Cedar. ORD. *Coniferæ.* Evergreen trees. Flowers monœcious; male catkins solitary in the axils of the upper leaves. Leaves rigid, linear-falcate, acute, quadrangular, scattered. Cones less than 1in. in diameter, terminal, and solitary; scales loose, cuneate, prickly, with from three to six winged seeds. Cryptomerias are hardy in most parts of this country, but their beauty is only fully developed in deep rich soils, with abundance of moisture, and protection from cutting winds. Propagated by seeds and cuttings, planted in sandy soil, under a handlight. Probably there is only one species (*C. japonica*) with a fair claim to that title, but several varieties are described as such.

FIG. 556. CRYPTOMERIA ELEGANS.

C. elegans (elegant).* *l.* linear, flattened, soft in texture, decurrent at the base, acute, spreading, falcate, channelled both above and beneath. Branches short, horizontal; branchlets pendulous at their extremities. Trunk robust, upright. *h.* 20ft. and upwards. Japan, 1861. Autumnal colour bronzy-crimson, which is retained throughout the winter. When well-grown, this is a most beautiful tree. See Fig. 556.

Cryptomeria—*continued.*

C. e. nana (dwarf), is a low dense bushy shrub, with more crowded leaves than the type; it also retains the autumnal colour, except the pendulous green tips of the branchlets.

C. japonica (Japanese). *l.* rigid, incurved, crowded, spirally arranged, 6in. to 9in. long, decurrent at the base. *cones* globular, about ½in. in diameter, composed of numerous scales, bearing three to five seeds each. Branches numerous, brittle, and readily separating from the trunk, frondose, spreading; lower ones deflexed, with the extremities ascending; branchlets very numerous, usually alternate, bright green. Trunk erect, tapering. *h.* 50ft. to 100ft. Japan, 1844. A handsome rapid-growing tree, with an elongated pyramidal outline. There are several varieties, the best of which are described below. Other forms are: *araucarioides*, *nigricans*, and *variegata*.

C. j. Lobbi (Lobb's) differs from the type in its more compact and less pendulous habit; foliage of a brighter and deeper green; leaves shorter, and more closely appressed to the branches. Japan. SYN. *C. viridis.*

C. j. nana (dwarf). A small procumbent bushy shrub, very useful for growing on rockwork. *h.* 2ft. SYN. *C. j. pygmæa.*

C. j. pygmæa (pigmy). A synonym of *C. j. nana.*

C. j. spiralis (spiral). A very curious form, having the falcate leaves closely appressed spirally round the branchlets.

C. viridis (green). A synonym of *C. japonica Lobbi.*

CRYPTOPHRAGMIA. *See* **Gymnostachyum.**

CRYPTOSORUS. *See* **Polypodium.**

CRYPTOSTEGIA (from *kryptos*, concealed, and *stego*, to cover; in reference to the scales in the throat covering the anthers). ORD. *Asclepiadeæ.* Handsome climbing stove evergreens, of easy culture in a mixture of loam and peat. Cuttings root freely if planted in sand, under a glass, in heat.

C. grandiflora (large-flowered).* *fl.* reddish-purple, large; corolla campanulately funnel-shaped; tube furnished with five inclosed narrow-bipartite scales inside, which cover the anthers, being opposite them; corymbs trichotomous, terminal. July. *l.* opposite, shortly petiolate, elliptic, bluntly acuminated, shining. East Indies, 1824.

C. madagascariensis (Madagascar). *fl.* pink. June. Madagascar, 1826.

CRYPTOSTEMMA (from *kryptos*, hidden, and *stemma*, a crown; the crown of the flower is hidden). ORD. *Compositæ.* A small genus (the three species of which are described below) of diffuse or creeping, hoary herbs. Pappus uniseriate, paleaceous, hidden amongst the hairs of the achene; receptacle honeycombed; involucral scales in many rows, imbricated. Leaves downy. Seeds should be sown on a gentle hotbed, in early spring. When the seedlings are large enough, two or three may be placed in a pot, and either grown entirely in a greenhouse, or placed out of doors about the middle of June.

C. calendulaceum (Marigold-flowered). *fl.-heads*, ray-florets pale yellow, purplish underneath, many, sterile, slightly three-toothed at the point, two-ribbed; disk-florets greenish, with a black-purple, five-cleft border, hermaphrodite, cut-shaped, smooth; receptacle honeycombed, bristly; peduncles one-flowered at the ends of the branches, two or three together, long, striate, clothed with weak red hairs. May and June. *l.* lyrate pinnatifid, three-nerved, on the upper side green, hispid; on the under tomentose, white. Cape of Good Hope and Australia. A tender annual. (B. M. 2252.)

C. Forbesianum (Forbes's). *fl.-heads*, ray-florets yellow; disk dark-coloured. Summer. *l.* quite glabrous above, snow-white beneath, pinnatipartite (some simple); lobes linear lanceolate, quite entire, with revolute margins. Stemless. Cape of Good Hope.

C. niveum (snowy). *fl.-heads* yellow, solitary. *l.* long-stalked, ovate, cordate, or roundish. Cape of Good Hope. A decumbent or creeping branched herb, white-woolly in most parts. SYN. *Microstephium niveum.*

CUBA BAST. The inner bark of *Hibiscus elatus.*

CUCKOO BUDS. *See* **Ranunculus bulbosus.**

CUCKOO FLOWER. *See* **Cardamine pratensis** and **Lychnis Flos-cuculi.**

CUCKOO PINT. *See* **Arum maculatum.**

CUCKOO SPIT. *See* **Frog Hopper.**

CUCULLATE. Hooded; when the sides or apex of anything are curved inwards, so as to resemble a hood.

CUCUMBER (*Cucumis sativus*). The Cucumber is believed to be a native of warm countries in Asia, and also of Egypt, where it has been extensively grown from a very early period. Fig. 557 represents a lateral growth, showing flowers of both sexes. Its cultivation is a matter of importance in almost every garden, and there are very few of any pretensions where it is not attempted, either in houses, frames, or in the open air, in summer. Cucumbers are also extensively grown for market purposes, and, as a rule, prove very remunerative. To cultivate them successfully, plenty of light, heat, and moisture, are required. Those who grow for supplying the market, invariably use span-roofed houses having large panes of glass, and probably no better could be chosen. Such houses cannot, however, be obtained in the majority of gardens; consequently, those situations should be selected which are most favourable to the above-named necessary conditions.

Cultivation. To keep up a supply all the year round, is a matter of great difficulty where there is not provision for adopting various methods, according to the season. In summer, Cucumbers will grow and fruit freely in frames or pits with a little dung heat; but in winter, a light house, with plenty of both top and bottom-heat at command, is absolutely necessary. Their cultivation outside in summer is a matter of uncertainty, excepting in very warm and sheltered positions, or in the case of the Short Prickly and a few others of the hardier kinds. Cucumbers delight in a rather light soil, and during the spring and summer plenty of water, applying liquid manure frequently at the time they are bearing heavily.

Culture under Glass. Beginning with spring and summer supply, seeds should be sown the end of January, and at short intervals during the three following months, as the plants soon get too large if their respective situations are not ready for them at the proper time; and others should therefore be coming on. If allowed to get pot-bound, they become infested with insects, and should be thrown away. It is best to sow singly, in small pots, to prevent injury to the roots when repotting. Plunge them in a good bottom heat, and, as soon as up, admit all the light possible, especially in January and February. The house intended for them should be well cleaned previous to planting, and the soil put in in small heaps, to get thoroughly warmed. Light turfy loam, not broken too small, with the addition of about one-half or one-third the quantity of well-decayed manure, will be found a good compost. The trellis should not be nearer the glass than 1ft., and a stake should be put to the plants as soon as they are put in, to prevent them breaking off. A temperature of 70deg. to 75deg., or higher on bright days, with a minimum night temperature of 60deg., should be maintained, keeping the walls and passages damped frequently. Airing and syringing will greatly depend on the outside temperature; in early spring, very little of either will be necessary; but, as summer

FIG. 557. LATERAL GROWTH OF CUCUMBER.

Cucumber—*continued.*

advances, the plants may be syringed morning and evening, using water that has been standing in the house to warm. Plenty of air should be admitted in warm weather, but draughts must be avoided. The training will consist chiefly in stopping the main shoot when on to the trellis, to train the laterals a good distance apart, and keep thinning out, to admit all the light possible. Additional soil should be given each time the roots appear through the mounds, until sufficient is collected to enable the plants to reach their limits, when liquid manure may be applied. Light, thin shading will be necessary in bright weather, or the leaves will burn, especially if there is any water on them. Plants that are required to stand the winter, should be inserted not later than the end of August, or early in September, in order to get them well established before the cold weather sets in. Great care and attention are necessary with winter Cucumbers, particularly during November and December, when least sunshine is generally experienced. All the sun and light possible must be obtained, and it is rarely necessary to open the ventilators at this season, unless the laps of the glass are airtight. Watering must be done very carefully, and syringing, unless in exceptionally mild weather, should be withheld. Cucumbers should not be planted thickly; if in a large house, a good vigorous plant will cover several yards of trellis, and will produce plenty of fruits throughout its whole length. Where space is limited, they may be grown in large pots, and trained up a rafter; top-dressing the plants with rich soil, and supplying liquid or artificial manure. Excellent crops can be obtained by this method if the plants receive attention.

Green Fly, Red Spider, and Thrips are the worst insect enemies to Cucumbers. Fumigating must be done very carefully to destroy the Fly, on two successive evenings. As soon as Red Spider or Thrips are detected, it is best to at once sponge the infested leaves with soapy water, and so prevent the insects spreading to others. The leaves must be handled with great care, as they are very brittle.

Culture in Pits and Frames. In gardens where stable litter and leaves are plentiful, a good supply of Cucumbers may be kept up during the summer by this method, without fire heat. The material to form the hotbed should be well mixed, and occasionally turned over for a week or two before it is required; and, if at all dry, it must be wetted, to cause fermentation. A thickness of about 3ft. will be sufficient for enclosed pits, adding 1ft. more for frames. In the latter case, the bed should be about 3ft. wider than the frames. Tread evenly, and place small heaps of soil at least 9in. from the glass, allowing it to remain with the sashes a little open for a few days, to let off any rank steam, which would prove fatal to the plants. Give plenty of room when growing, thinning out and stopping the shoots, to induce fruitfulness; supply plenty of water when necessary. If sufficient heat cannot be obtained, the frames should occasionally be lined with new fermenting material. As this system is now almost limited to summer cultivation, shading and plenty of air will be required. If Cucumbers be grown in the open air, a warm south aspect should be selected for the purpose. Dig out holes or trenches, and lay the soil on the north side. Fill up the holes with fermenting material, prepared as for frames; put some soil on the top, and plant out in May, affording protection for a time with bell glasses or hand lights. The seed should be sown in heat to obtain these plants about the end of March. Cucumbers produce male and female flowers. Except for seeding purposes, it

Cucumber—*continued.*

is not necessary that the latter should be fertilised, the fruit reaching the same size, and being all the better for the absence of seeds. In winter time, or in the case of weak plants, the whole of the male flowers might with advantage be kept removed. Tubular glasses, about 30in. long, are often used to grow straight Cucumbers for exhibition. Well-formed fruits are placed in them when young, and the glass being fixed by some means, the fruit is protected, and grows, in some cases, nearly the size of the glass. They are not used for ordinary purposes, as for fruit shown in Fig. 558.

Sorts. These are extremely numerous, as far as names are concerned, each year producing many so-called new or

FIG. 558. FRUIT OF CUCUMBER.

improved forms, which, however, do not get into general cultivation. Some grow to a length of over 2ft., but they are often coarse and deficient in quality. The following are amongst the best for general purposes, choosing the

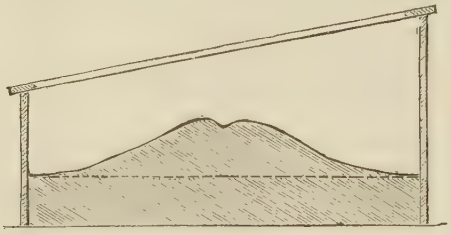


FIG. 559. SECTION OF SIMPLE FRAME.

first if only one variety is grown: Rollisson's Telegraph, Tender and True, Sion House, Turner's Blue Gown, Munro's Duke of Edinburgh, and Marquis of Lorne. Some of these grow a good length; but they are all very tender if used when from 1ft. to 18in. long.

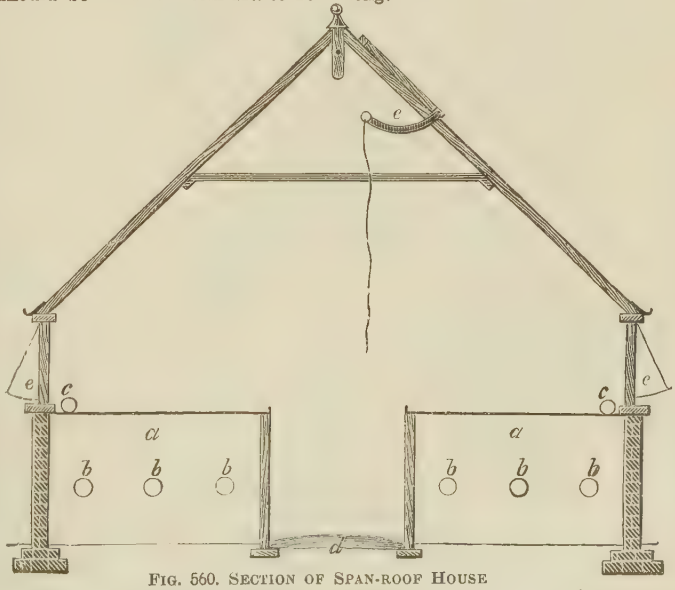


FIG. 560. SECTION OF SPAN-ROOF HOUSE
a a, Space for Bottom Heat; *b b b b b b*, Hot-water Pipes; *c c*, Pipes for Top Heat; *d*, Path; *e e e*, Ventilators.

Cucumber—*continued.*

Houses and Frames. Where accommodation for Cucumbers in the way of proper frames or houses is limited, those of almost any description may be utilised in summer by the aid of dung heat; but for winter supply, houses are necessary, having plenty of piping for fire-heat, with or without the addition of dung. Fig. 559 shows a section of an ordinary frame as prepared for a Cucumber plant. Pieces of slate, or other material, should be laid under the fruits to keep them from the soil. The ordinary span-

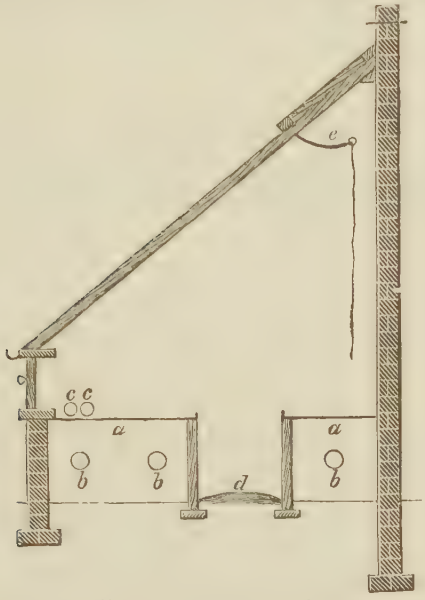


FIG. 561. SECTION OF LEAN-TO HOUSE.
a a, Space for Bottom Heat; *b b b*, Hot-water Pipes; *c c*, Pipes for Top Heat; *d*, Path; *e*, Ventilator.

roofed or half-span frame may be used in summer for Cucumbers, placing some heaps of manure, with soil on the top, a yard or more apart, and putting one plant on each. A lean-to pit, with south aspect, is suitable for winter, where only a few are grown, planting on the stage above the hot-water pipes. A somewhat similar

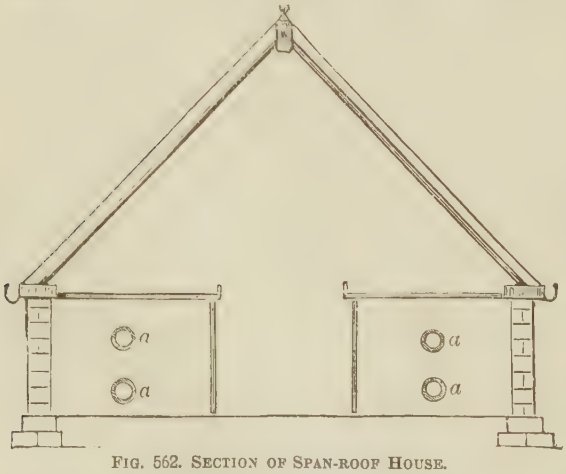


FIG. 562. SECTION OF SPAN-ROOF HOUSE.
a a a a, Hot-water Pipes for Bottom Heat.

system is adopted in a span-roofed house. Both would require additional fire-heat for winter. Fig. 560 repre-

Cucumber—*continued.*

sents a section of a suitable house for growing a large quantity of Cucumbers in summer, when plenty of air is needed. More pipes for the top heat would be necessary for spring. A section of a lean-to house is shown in Fig. 561, where the front part would suit Cucumbers, not allowing them to grow too far up to shade the back wall, which might be utilised for some other crop—Tomatoes, for instance. Fig. 562 shows a span-roof house, with heated beds, that, with the addition of sufficient top heat, might be used at any season. A cham-

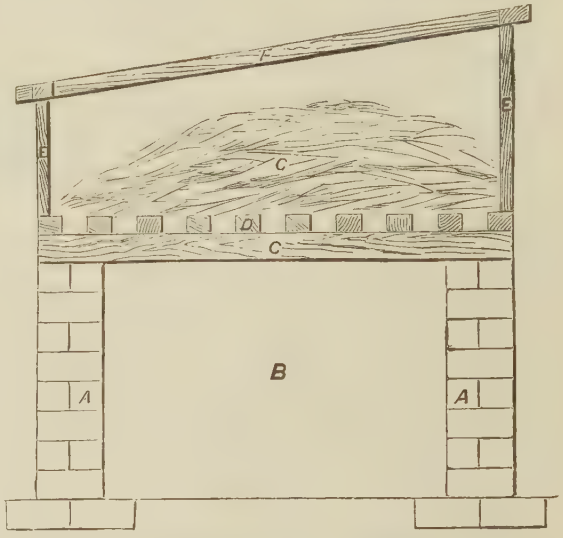


FIG. 563. SECTIONAL END VIEW OF A CHAMBERED FRAME.
A A, Brick Piers; *B*, Internal Space for Hot Manure or other Material; *C*, Support; *D*, Laths to support Bed; *E E*, Sides of Frame; *F*, Sash; *G*, Bed.

bered frame is shown in Fig. 563, which sufficiently explains itself. Such a frame might be fitted with hot-water pipes in the space shown for heating material; and the frame, with the bed removed, may be used for many other purposes. Either fixed or movable trellises, placed from 1ft. to 18in. from the glass, are necessary for all Cucumber houses. The fruits are much cleaner and of a better shape when grown on a trellis; but in the case of frames, this is impracticable.

CUCUMBER-TREE. An American name for **Magnolia acuminata** and **M. Fraserii** (which *see*).

CUCUMIS (etymology of name obscure). Cucumber. ORD. *Cucurbitaceæ*. A well-known genus of half-hardy trailing annuals or perennials. Flowers monœcious. Males in fascicles, rarely solitary; calyx tube turbinate or campanulate; limb five-lobed; corolla sub-campanulate, deeply five-lobed; stamens three, free. Females solitary. Fruit three to six-celled. The seed of all the species require to be sown on a hotbed in spring, and the seedlings should be planted out, when large enough to handle. *See also* **Cucumber, Melon, &c.**

C. Anguria (Anguria). *fl.* usually solitary. June to August. *fr.* white, globose, echinated. *l.* palmately sinuated, cordate at the base, scabrous. Stems rather slender; tendrils simple. Jamaica, 1692.

C. Citrullus. *See* **Citrullus vulgaris.**

C. Colocynthis. *See* **Citrullus Colocynthis.**

C. Hookeri (Hooker's). *fl.* yellow. *fr.* brownish-purple, marked with white bands, ovoid-cylindrical. *l.* deeply five-lobed; lobes obtuse, crenulately-denticulate. Tropical Africa, 1870.

C. Melo (Melon). *fl.*, males: tube of calyx rather ventricose at the base, and rather dilated at the apex; stamens inclosed; anthers shorter than their connectives. Females: calyx and

Cucumis—*continued.*

corolla as in the male; stigmas three to four, shortly two-lobed. *fr.* ovate or sub-globose, eight to twelve-furrowed; flesh sugary, yellow, red, or white. July. *l.* roundish, angular, petiolate. Stem trailing, scabrous, cirrhiferous. Asia, 1570. For special detailed culture, *see* **Melon.**

C. perennis. *See* **Cucurbita perennis.**

C. sativus (cultivated). Common Cucumber. *fl.* on short peduncles, large, usually in threes. July to September. *fr.* generally elongated, smooth or prickly, and usually shining. *l.* cordate, obscurely five-lobed, petiolate; terminal lobe the largest. Stems rough, bearing tendrils. Native place unknown. 1573. Cultivated in all warm countries. For cultivation and list of varieties, *see* **Cucumber.**

FIG. 564. FRUIT OF CUCURBITA MAXIMA COURGERO.

C. s. sikkimensis (Sikkim). *fl.* yellow. July. *fr.* reddish-brown, densely reticulated with pale yellow, large, singular in form, and ripening in July and August. Eastern Himalayas, 1875. This is one of the most remarkable varieties of the common Cucumber known, and was first botanically noticed by Sir Joseph Hooker, in 1848. In its native country, it is sold in the markets, and eaten both raw and cooked. (B. M. 6206.)

Other species are often cultivated, more from their curious fruit than from any particularly ornamental merit; among these are *C. dipsaceus* and *C. metuliferus.*

FIG. 565. CUCURBITA MOSCHATA, showing Leaves, Female and Male Flowers, &c.

CUCURBITA (from *Cucumis*, the Cucumber, and *orbis*, a globe; in allusion to the shape of the fruit). Gourd. ORD. *Cucurbitaceæ.* Half-hardy trailing annuals. Flowers monœcious; corolla yellow, campanulate. Males: calyx hemispherically campanulate; stamens three, one one-celled, two two-celled. Females: calyx obovate-clavate, narrowed towards the top, or campanulate, and always circumcised under the limb after flowering. For culture, &c., *see* **Gourds.**

C. maxima (largest). Large Hollow Gourd or Pumpkin. *fl.*, tube of calyx obovate, ending in a short neck. July. *fr.* yellow, red, or green, globose, somewhat depressed. *l.* cordate, very

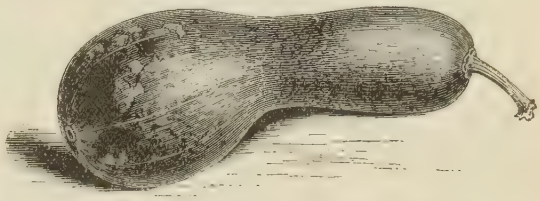


FIG. 566. FRUIT OF CUCURBITA MOSCHATA.

FIG. 567. CUSTARD GOURD (CUCURBITA PEPO VARIETY).

rugged; petioles hispid. Native country unknown. Cultivated in all warm and temperate parts of the globe.

C. m. Courgero (Courgero). *fr.* green or yellow, small, full at

FIG. 568. CUCURBITA PEPO GOURD, showing (1) Leaf, and (2) Male and (3) Female Flowers.

Cucurbita—*continued.*

maturity. *l.* ovate, cordate, three to five-lobed, somewhat cochleate. Stems assurgent, dwarf. See Fig. 564.

C. m. viridis (green). Large Green Gourd. *fr.* green, large, hollow at maturity. Stems very long, climbing.

C. moschata (musky). Musk Melon. *fl.*, calyx hemispherically campanulate, short, having the throat much dilated. May. *fr.* depressed. *l.* cordate, obtuse, somewhat five-lobed, denticulated. Tendrils usually transformed into very imperfect leaves. Native country unknown. 1597. See Figs. 565 and 566.

C. Pepo. Pumpkin. *fl.*, calyx ending in a neck beneath the limb. June to August. *fr.* roundish or oblong, smooth. *l.* cordate, obtuse, somewhat five-lobed, denticulated. Levant, 1570. The Custard Gourd (Fig. 567) is one of the best-known of the very numerous forms of this species, of which there are also roundish and oblong-fruited ones. Fig. 568 represents (1) leaf and (2) male and (3) female flowers of one of the long-fruited varieties.

C. P. aurantia (orange). Orange Gourd. *fl.* yellow. Summer. *fr.* having the appearance and colour of an orange, globose, smooth. *l.* sub-cordate, three-lobed, cuspidate, sharply denticulated. Native country unknown. 1802. Plant very scabrous. There are two or more varieties.

C. P. ovifera (egg-bearing). Egg-bearing Gourd, or Vegetable Marrow. *fl.*, calyx obovate, ending in a short neck, and cut round after flowering to the neck. July to September. *fr.* greenish or yellowish, figure of an egg, obovate or ovate, smooth. *l.* cordate, angular, five-lobed, denticulated, pubescent. Native country unknown. There are grey-fruited, pear-shape-fruited, and subglobose-fruited forms of this species. *See also* **Vegetable Marrow.**

C. P. verrucosa (warted). Warted Gourd. *fr.* roundish-elliptic, warted. *l.* cordate, deeply five-lobed, denticulated; middle lobe narrow at the base. 1658. In America, this is commonly grown for culinary purposes, but in England chiefly as a curiosity.

C. perennis (perennial). *fl.* about the size of *C. Pepo*; lobes of calyx subulate. *fr.* nearly sessile, orbicular, smooth, usually four-celled. *l.* triangularly cordate, with undulated margins. Tendrils trichotomous. Native place doubtful. SYN. *Cucumis perennis.*

CUCURBITACEÆ. A large order of succulent climbing plants, with solitary lateral tendrils. Flowers solitary, panicled, or in fascicles, monœcious or dicœcious; corolla of five (rarely three or six) petals, sometimes fringed, with strongly-marked reticulated veins. Fruit fleshy, more or less succulent. Leaves alternate, petiolate, palmate or pedate, often cordate, succulent, rough. There are about seventy genera (including *Bryonia, Cucumis, Cucurbita,* and *Trichosanthes*) and about 470 species.

CULCASIA (from *Kulkas*, the Arabic name for *Colocasia antiquorum*, a plant of the same family). SYN. *Denhamia.* ORD. *Araceæ.* Stove evergreen climbers, allied to **Philodendron** (which *see* for culture, &c.).

C. scandens (climbing). *fl.*, spathe whitish-brown; sheaths petiolar, long, equal to the scape. June. *l.* ovate-lanceolate, acuminate. Stem twining, suffrutescent. West Africa, 1822.

CULM. The straw or stem of grasses.

CULTRATE, CULTRIFORM. Shaped like a pruning-knife.

CULVER'S PHYSIC. *See* **Veronica virginica.**

CUMINGIA CAMPANULATA. *See* **Conanthera campanulata.**

CUNEATE, CUNEIFORM. Wedge-shaped; the broadest end uppermost, tapering to the base.

CUNILA (an ancient Latin name, of unknown origin). ORD. *Labiatæ.* A genus containing about twelve species of herbs or sub-shrubs, natives, for the most part, of North America. Flowers white or purplish, small; corolla two-lipped, with the upper lip erect, flattish, mostly notched, and the lower somewhat equally three-cleft; calyx ovate-tubular, equally five-toothed, and hairy in the throat. Leaves large, dentate. *C. mariana* is perhaps the only species yet introduced to cultivation. It is a hardy perennial, thriving in a loam and peat soil. Increased by root division.

C. mariana (Maryland). Common Dittany. *fl.* purplish; cymes peduncled; calyx striated. July to September. *l.* smooth, ovate, serrate, rounded or heart-shaped at the base, nearly sessile, dotted, 1in. long. Stems tufted, corymbosely much-branched. *h.* 1ft. South New York to Ohio, Illinois, and southward. (S. B. F. G. 243.)

FIG. 569. CUNONIA CAPENSIS.

CUNNINGHAMIA (named after J. and A. Cunningham, two celebrated botanical collectors, the former being the discoverer of this Conifer). Broad-leaved China Fir. ORD. *Coniferæ.* An evergreen tree, not hardy except in very favoured spots. It is too large to be allowed space in the greenhouse, and, when grown in the open, it is almost invariably disfigured by the violence of winds and frost. With these impediments of primary importance, the tree will never become largely grown; it has, however, been frequently seen doing well. Cunninghamia requires

Cunninghamia—*continued.*

a well-drained light soil, and is best propagated from seeds, as cuttings rarely make good plants.

C. sinensis (Chinese).* *fl.*, males in grouped catkins, which are terminal, fascicled, cylindrical, and about 1in. long; females with three ovules. *cones* about the size of a walnut, sessile, drooping, globose, smooth; scales ovate-acuminate, coriaceous, sharply denticulated on the margin. *l.* sessile, deflexed, spreading in every direction, 1½in. long, lanceolate, much pointed, rigid, flat, entire, somewhat scabrous on the margin. Branches for the most part verticillate, spreading horizontally. Trunk straight, cylindrical. *h.* 40ft. to 50ft. (much less in Europe). China, 1804. (B. M. 2743, under name of *C. lanceolata.*)

CUNONIA (named after John Christian Cuno, of Amsterdam, who described his own garden in verse, in 1750). TRIBE *Cunonieæ* of ORD. *Saxifrageæ*. A greenhouse tree. Flowers disposed in axillary racemes; calyx five-parted; petals five, oblong; stamens ten. Fruit a two-celled capsule. Leaves impari-pinnate; leaflets serrated, coriaceous; stipules large, caducous, interpetiolar. It is of easy culture in sandy loam and peat. Half-ripened cuttings will root, if inserted in sandy soil, and placed under glass, in a very gentle heat.

C. capensis (Cape Colony). *fl.* white; racemes spicate, opposite; pedicels numerous, in fascicles. August. *l.*, leaflets five to seven, lanceolate. *h.* 10ft. to 50ft. Cape of Good Hope, 1816. A large shrub or middle-sized tree, glabrous in all its parts. See Fig. 569. (L. B. C. 826.)

CUNONIEÆ. A tribe of *Saxifrageæ*.

CUP. The same as **Corona** (which *see*).

CUPANIA (named after Father Francis Cupani, an Italian monk, author of "Hortus Catholicus," and other botanical works; he died in 1710). ORD. *Sapindaceæ*. Ornamental stove trees or shrubs. Flowers whitish, in panicles or racemes. Leaves exstipulate, abruptly pinnate, or from abortion simple; leaflets opposite and alternate. The species number about thirty; they are found in tropical regions throughout the world. They thrive in a compost of loam and peat. Cuttings of half-ripe shoots will root in sand, if placed under a hand glass, in heat. Very few species of this rather large genus are seen in cultivation.

C. americana (American).* *fl.*, petals yellowish, triangular, hairy on the outside. *l.*, leaflets three to four pairs, obovate, retuse, clothed with fine rusty tomentum beneath, serrate-toothed at the top of the lateral; outer leaflets largest. *h.* 30ft. South America, 1818. SYN. *C. tomentosa.*

C. sapida (savoury). Savoury Akee-tree. *fl.* whitish. March. *l.*, leaflets three or four pairs, ovate-lanceolate, veiny. *h.* 30ft. West Africa, 1793. Naturalised in West Indies.

C. tomentosa (tomentose). A synonym of *C. americana.*

CUPHEA (from *kyphos*, curved; in reference to the form of the capsule). ORD. *Lythraceæ*. Very pretty greenhouse herbs or sub-shrubs. Flowers usually drooping; calyx tubular, coloured; peduncles interpetiolar, one or many-flowered. Leaves opposite, rarely in whorls, quite entire. Only a few of the numerous species are generally grown. Cuttings of the perennial sorts strike freely in March or April, if placed in brisk bottom heat; but by far the better method is to sow seed, in January or February, and grow the seedlings on in rich soil, repotting when necessary. Most of the dwarf species will succeed if finally placed in 6in. pots, and fed with liquid manure when these are filled with roots. Cupheas are of easy culture, and a few, particularly *C. ignea*, propagated from cuttings, are well adapted for greenhouse decoration, or for small beds in the flower garden in summer.

C. æquipetala (equal-petalled). *fl.* purple. June. *h.* 2ft. Mexico, 1859. SYN. *C. ocimoides.*

C. cinnabarina (cinnabar). A synonym of *C. pinetorum.*

C. cyanea (blue). *fl.* yellow and red, alternate. July. *l.* ovate-oblong, acute, rounded at the base. Branches and calyces clammy and hispid. Andes. Evergreen. SYN. *C. strigillosa.* (B. R. 32, 14.)

C. Hookeriana (Hooker's). *fl.* vermilion and orange, curved, cylindrical, disposed in dense panicles. *l.* lanceolate. *h.* 2ft. to 3ft. Mexico, 1877. A novel and striking under-shrub. SYN. *C. Roezlii.* (R. H. 1877, 469.)

Cuphea—*continued.*

C. ignea (fiery). *fl.* bright scarlet, apetalous, with a black and white expanded limb. Summer. *l.* nearly glabrous, lanceolate. *h.* 1ft. Mexico, 1845. Evergreen. SYN. *C. platycentra.* (F. d. S. 180.)

C. jorullensis (Jorullan). *fl.* red; pedicels one to three together, alternate, racemose at the tops of the branches; calyx clammy. Summer. *l.* oblong-lanceolate, acute, on very short petioles, rounded at the base. Branches compressed, clothed with pubescence. *h.* 2ft. Mexico, 1856. Evergreen.

C. lanceolata (lance-shaped). *fl.* bluish, sub-spicate, sub-secund. July. *l.* opposite, oblong-lanceolate, obtuse, hairy. *h.* 1½ft. Mexico, 1836. Plant ascending, clammy, hispid from brown hairs. Annual. Evergreen. SYN. *C. silenoides.* (B. M. 4362.)

C. Melvilla (Melvilla). *fl.*, calyx red at the base, and green at the apex, long; racemes terminal, simple, many-flowered. May. *l.* sessile, lanceolate, attenuated at both ends. *h.* 2ft. to 3ft. Guiana, 1823. Herbaceous perennial. (B. R. 852.)

C. miniata (vermilion). *fl.* pale vermilion, solitary, axillary, on short pedicels. June to September. *l.* ovate-acuminate, covered with white bristles. *h.* 2ft. Mexico, 1843. Evergreen. (F. d. S. 65.)

C. ocimoides (Basil-like). A synonym of *C. æquipetala.*

C. pinetorum (pine-wood-loving). *fl.* crimson or deep purple, panicled. July. *l.* nearly sessile, ovate-lanceolate, strigose. Branches ascending. *h.* 1½ft. Mexico, 1850. Evergreen. SYN. *C. cinnabarina.* (F. d. S. 527.)

C. platycentra (broad-centred). A synonym of *C. ignea.*

C. procumbens (procumbent). *fl.*, petals rose-coloured; sepals purplish; pedicellate, solitary, deflexed. June. *l.* opposite, shortly petiolate, ovate-lanceolate. Branches procumbent. Mexico, 1816. Stove annual. (B. R. 182.)

C. Roezlii (Roezl's). A synonym of *C. Hookeriana.*

C. silenoides (Silene-like). A synonym of *C. lanceolata.*

C. strigillosa (coarse-haired). A synonym of *C. cyanea.*

C. Zimapani (Zimapani's). *fl.* blackish-purple, purple. Autumn. *h.* 2ft. Mexico, 1878. Evergreen. (B. M. 6412, under name of *C. lanceolata.*)

CUPRESSUS (from *kuo*, to produce, and *parisos*, equal; in reference to the symmetrical growth of *C. sempervirens*). Cypress. ORD. *Coniferæ*. Very ornamental evergreen shrubs or trees. Flowers monœcious. Fruit globular, composed of peltate ligneous persistent scales,

FIG. 570. CUPRESSUS CONE, with the Scales separating.

separating at maturity (see Fig. 570), to free the usually numerous slightly-winged seeds. Leaves minute, scale-like, imbricate, or linear-acute, spreading. Few of the whole genus are really hardy; the remainder are liable to be much damaged by severe frosts and fierce winds. In the South and West of England and Ireland, they, as a rule, thrive very well. Any common garden soil suits the hardy sorts, but they succeed best in a rather deep soil, and in a sheltered situation. They may be propagated either by cuttings or by seeds. The latter may be easily collected when the matured cones burst open in early spring, and should be sown in April, in a warm friable soil. The seedlings will appear before the end of May. After the first year's growth, the young plants should be transplanted into rows, and removed again every second year, with the view of causing their roots to become fibrous and bushy. Nurserymen are in the habit of shifting them into pots of increasing size.

C. californica (Californian). A synonym of *C. Goveniana.*

C. cashmeriana (Cashmere). A synonym of *C. torulosa.*

C. elegans (elegant). A synonym of *C. Knightiana.*

C. funebris (funereal).* *l.* yellowish-green, scale-like, closely appressed, imbricated. Branches horizontal when matured, becoming pendulous at their extremities, giving the whole tree a very graceful, weeping appearance. *h.* 50ft. North-east China. 1849. Half-hardy. SYN. *C. pendula.* (F. d. S. vi. 89.)

C. glandulosa (glandular). A synonym of *C. MacNabiana.*

C. glauca (grey). A synonym of *C. lusitanica.*

Cupressus—*continued.*

C. Goveniana (Gowen's).* *fl.*, male catkins yellow, very numerously produced in spring. *l.* scale-like, closely imbricated, bright green. Branches spreading, with numerous, irregularly disposed, slender branchlets. *h.* 15ft. to 20ft. California, 1846. A dwarf shrub, having a dense habit. SYNS. *C. californica* and *C. Hartwegii.*

C. Hartwegii (Hartweg's). A synonym of *C. Goveniana.*

C. Knightiana (Knight's).* A very rare tall tree, of elegant habit, described by Messrs. Veitch as "with drooping, feathery, and fern-like branchlets, and well distinguished by the glaucous, bluish hue of its foliage." It is the hardiest of Mexican Cypresses, but requires, in this country, a sheltered situation. *h.* 40ft. to 60ft. Mexico, 1838. SYNS. *C. elegans* and *C. Lindleyana.*

C. Lambertiana (Lambert's). A synonym of *C. macrocarpa.*

C. Lawsoniana. *See* **Chamæcyparis Lawsoniana.**

C. Lindleyi (Lindley's). A synonym of *C. Knightiana.*

C. lusitanica (Portugal).* Cedar of Goa. *l.* imbricated in four rows, acute, keeled, glaucous, adpressed. Branches flexuose, spreading; branchlets numerous, incurved, scattered. *h.* 40ft. to 50ft. Goa, 1683. A very handsome low tree, but only half-hardy. SYN. *C. glauca.*

C. MacNabiana (MacNab's).* *l.* small, scale-like, arranged in four rows, deep green. Branches short, thickly set; branchlets numerous, rigid. *h.* 10ft. to 15ft. North California, 1853. A densely branched, hardy shrub, with a pyramidal outline. SYNS. *C. glandulosa* and *C. nivalis.*

FIG. 571. FRUITING BRANCH OF MONTEREY CYPRESS (CUPRESSUS MACROCARPA).

C. macrocarpa (large-fruited).* Monterey Cypress. *l.* very dark green, closely imbricated. Branches numerous, close set, horizontal, with the extremities ascending; secondary branches generally lateral and opposite. *h.* 50ft. to 60ft. South California, 1847. A hardy, medium-sized tree, of great beauty, and of extremely rapid growth. See Fig. 571. SYN. *C. Lambertiana.*

C. nepalensis (Nepaul). A synonym of *C. torulosa.*

C. nivalis (snowy). A synonym of *C. MacNabiana.*

C. pendula (pendulous). A synonym of *C. funebris.*

C. sempervirens (evergreen).* "This is the fastigiate or upright kind—a tall, tapering tree, with erect branches growing close to the trunk, and with frond-like branchlets covered with smooth, imbricated, yellowish-green leaves. The cones are about 1in. in diameter, and are generally produced in pairs." *h.* 6ft. to 100ft. South Europe, 1548. Hardy in the South of England, and probably in many other places in Britain. The following names have been applied by various authorities to forms of this species: *horizontalis, indica.*

Cupressus—*continued.*

C. torulosa (twisted).* *l.* glaucous, appressed to the stem, thin, minute, very smooth, closely imbricated in four rows. Branches short, ascending, much ramified at their extremities; branchlets slender, short, twisted. *h.* 50ft. to 70ft. Himalayas, 1824. A very beautiful pyramidal, hardy, much-branched tree. SYNS. *C. cashmeriana* and *C. nepalensis.* The variety *Corneyana* is a low tree, with slender drooping branchlets, and comes extremely close to the type.

CUPULA. The cup of an acorn, or other similar fruit.

CUPULAR, CUPULIFORM. Shaped like a cup.

CUPULIFERÆ. A very important natural order of trees and shrubs. Flowers monœcious. Male solitary, crowded, or in spikes, bracteate; sepals unequal, one to five or more, or absent; stamens two to twenty on a disk, or adnate to the bases of the sepals; anthers two-celled. Female: calyx adnate to the ovary, or absent; ovary inferior, after fertilisation more or less completely two to three (rarely four to six) celled; styles stigmatose above and within. Fruit indehiscent, seated on, or inclosed within, the hardened accrescent bracts. There are ten genera, and about 400 species. They are principally confined to the temperate regions of the Northern hemisphere, but some are found in New Zealand, Chili, and the mountains of Java, Borneo, South Australia, &c.

CURATELLA (from *curatus*, worked; the leaves, which have a rough surface, are employed in Guiana for polishing bows, sabres, and other weapons). ORD. *Dilleniaceæ.* A genus containing a couple of species of very ornamental dwarf stove evergreen shrubs, with white flowers, winged petioles, and ovate rough leaves. They thrive in a compost of loam and peat. Ripened cuttings will root freely if planted in a pot of sand, with a hand glass placed over them, in heat. Probably the only one in cultivation is the following:

C. americana (American).* *fl.* white; racemes issuing from the adult branches. *l.* ovate, repand, and somewhat denticulated, very rough, running along the petiole at the base. *h.* 10ft. South America. The bark of this shrub is thick, wrinkled, and cracked, and falls off in large pieces.

CURCULIGO (from *curculio*, a weevil; the seeds have a point like the beak of a weevil). Weevil Plant. ORD. *Amaryllideæ.* Of this genus, the only plants worthy of general cultivation are *C. recurvata* and its variegated forms. These are very ornamental stove foliage plants, of palm-like growth. Their culture is easy; they thrive in a compost of peat and loam, in equal parts, and used in moderate-sized lumps, with a fair proportion of silver sand. The drainage must be perfect. Propagation is effected by suckers, which form at the base of the stem.

C. recurvata (recurved).* *fl.* yellow, produced in dense heads, on scapes shorter than the leafstalks. *l.* spreading, recurved, lanceolate, longitudinally plaited, dark green; petioles long, erect. East Indies. (B. R. 770.)

C. r. striata (striped).* *l.* marked with a distinct and effective central band of pure white; petioles whitish at the back.

C. r. variegata (variegated).* *l.* recurved, plaited, oblong-lanceolate, upwards of 2ft. long and 6in. broad, bright green, beautifully banded longitudinally with stripes of clear white; petiole 1½ft. long. Rhizome tuberous. East Indies. A very handsome variegated plant.

CURCULIO. *See* **Weevils.**

CURCUMA (from *Kurkum*, its Arabic name). Turmeric. ORD. *Scitamineæ.* A genus of above thirty interesting stove herbaceous plants. Flowers in spikes, with concave bracts; calyx tubular, three-toothed; tube of corolla dilated above, five lobes equal, lip larger and spreading; filament petaloid, three-lobed at the top, with a two-spurred anther on the middle lobe. They do well in a

Curcuma—*continued.*

compost of loam and peat, in proportions of two-thirds of the latter to one of the former, to which may be added a little sand. Propagated by root divisions.

C. albiflora (white-flowered).* *fl.* white, yellow. July. *l.* long-stalked, glabrous, somewhat plaited parallel to the nerves, deep green above, paler beneath. *h.* 2ft. Ceylon, 1862. (B. M. 5909.)

C. australasica (Australian).* *fl.* yellow; spikes many-flowered; upper bracts rose-coloured, forming a pretty crown to the inflorescence. *l.* oblong-lanceolate, light green. Australia, 1867. (B. M. 5620.)

C. cordata (heart-shaped).* *fl.* reddish-yellow; spikes central; bracts ovate-obtuse; tuft at top of spike violaceous. July. *l.* ovate-cordate, acuminate, clothed with silky hairs. *h.* 1ft. East Indies, 1846. (B. M. 4435.)

C. elata (tall). *fl.* crimson; spikes lateral. May. *l.* sessile, villous beneath, green. *h.* 3ft. East Indies, 1819.

C. leucorhiza (white-rooted). *fl.* reddish-yellow; spikes lateral, few-flowered, comose. May. *l.* smooth, pure green. *h.* 1ft. East Indies, 1819.

C. longa (long). *fl.*, spikes central. August. *l.* long-stalked, broad, green. *h.* 2ft. East Indies, 1759. (B. M. Pl. 269.)

C. petiolata (petiolate).* *fl.* pale yellow; spikes 5in. or 6in. long, on a stout peduncle; bracts rosy-purple, shortly ovate. September. *l.* rather large, oblong-lanceolate, acuminate, cordate at the base. *h.* 1½ft. Pegu, 1869. (B. M. 5821.)

C. Roscoeana (Roscoe's).* *fl.* scarlet; bracts bright orange; spike nearly 1ft. long. August. *l.* large, oblong, about 1½ft. across. *h.* 1ft. East Indies, 1837. A very handsome species. (B. M. 4667.)

C. rubricaulis (red-stemmed).* *fl.* red; spikes lateral. May. *l.* stalked, oblong, with red sheaths. *h.* 1ft. East Indies, 1822.

C. Zedoaria (Zedoary). *fl.* red; spikes lateral. April to August. *l.* broad, sessile, silky beneath. *h.* 3ft. East Indies, 1797. (B. M. 1546.)

CURMERIA. Included under **Homalomena.**

CURRANT (*Ribes*). There are three distinct types of Currants in cultivation—the Red (see Fig. 572), obtained

FIG. 572. FRUITING BRANCH OF RED CURRANT.

from *Ribes rubrum*; the White, a variety of the same species; and the Black (*R. nigrum*). Both species are either natives of Britain, or have been introduced from some other part of Europe at a period unknown. The fruit of the Red Currant is largely used for tarts; it is also preserved in the form of jelly, or mixed with raspberries for jam. The White is generally less acid, and is more used for dessert, with a few Red ones intermixed. Black Currants are almost wholly utilised for cooking and preserving, and are supposed to possess medicinal properties not found in either of the others. The trees grow in almost any position, and the crop is often a remunerative one to cottagers, particularly near large towns, and also to market gardeners. Currants are in great demand in private gardens; and, in this case, if the trees are planted in different positions, and protected, the fruiting season may be considerably prolonged.

Currant—*continued.*

Propagation. Currants may be propagated by seeds, cuttings, layers, or suckers; and, in special cases, grafting may be employed, using suckers or gross-growing seedlings for stocks. Seeds are only sown for raising new varieties; but as the chances of obtaining improvements on those sorts already existing, are extremely doubtful, this method is but little adopted. Suckers are objectionable, as they are often gross-growing and not free-fruiting; they are also very liable to reproduce suckers. Layers root easily if the trees are dwarf and the shoots can be brought to the ground in order to be pegged down; but this mode is seldom used, and is not here recommended. Propagation by cuttings is the best and most generally practised plan. These should consist of strong well-ripened young shoots, taken off close to the old wood if possible. If a length of from 12in. to 15in. can be procured, the cuttings should be placed 6in. in the ground, first carefully removing the whole of the eyes in this part, and also from some part of the wood above ground, so as to form a stem. The earlier they are taken in autumn after the wood is matured, and inserted, the better; but if this is not practicable, any time when the ground is suitable, up till the end of February, will be tolerably safe. The best method of putting in cuttings is to dig a trench of suitable depth, somewhat vertically, and place them about 6in. apart, afterwards filling in and treading firmly. A space of 1ft. should be allowed between the lines, and each other line proceeded with in the same way after the first one is finished.

Soil and Site. Being vigorous root-producing plants, Currants do best in good rich loam, 2ft. or more in depth, rather heavy than otherwise, so as to retain moisture. In dry seasons, if they are growing in light soil and are not kept watered, the fruit shrivels or ripens prematurely, being in either case inferior. Any fairly good soil will grow Currants of moderate quality; but for large crops and fine fruit, the conditions above mentioned are the best. Manure water, applied when the fruit is swelling, will increase the size, but often affects the flavour. Established trees should have a good annual dressing of farmyard manure or cowdung after the winter pruning, removing a little of the soil round the trees and placing the manure in, afterwards covering it with the soil. Red and White Currants are often cultivated on the back walls of lean-to glass houses, or other similar positions, in order to prolong the season of fruit supply as much as possible; but the crop from such trees can hardly be expected to have the flavour of that more exposed to the sun. The bush form is invariably adopted for Black Currants, and for the main crop of the Red. A space of 5ft. or 6ft. must be allowed between the trees in the open quarters, and a south aspect should be avoided, especially in light soils. Bush trees, 3ft. high and as much in diameter, are sometimes grown alternately with pyramid Apple or Pear trees, by the sides of walks; and Currants trained as pyramids are also well adapted for such positions. The earlier the planting can be done in autumn, after the leaves are off, the better, as new roots are then formed at once, and a crop secured the following season, presuming the plants are large enough.

Pruning and Training. For covering walls, a good plan is to place young plants 3ft. apart, selecting the three strongest shoots, and training one of them upright in the centre, and the other two equidistant on either side, thus placing all the main shoots 1ft. apart. Cut back if at all weak, allowing them in course of time to reach the desired height, and occasionally shorten all the laterals. Bush trees should have a clean stem of 6in. or more at the bottom, and from six to twelve main shoots, according to the size of bush intended to be grown. Occasionally, pyramids are formed by training one strong shoot to a good height, shortening it each year, to insure the production of spurs for fruiting. When trained in this way, Currants have a fine effect, and are almost certain to produce good crops, which have the advantage of being kept

Currant—*continued.*

free from dirt, while those on bushes are often made very muddy by heavy storms. A large quantity of wood is made in summer, and this should be thinned and shortened, but not too severely, about the beginning of July. This will materially assist in ripening the fruit, by admitting more light, and also help to ripen the other wood. The winter pruning will consist in shortening the main shoots, where they have not attained the desired height, to about 6in., and cutting all the young wood on the spurs nearly close in. This process applies chiefly to Red and White Currants. The Black varieties require different treatment, as in this case the fruit is produced on the wood of the previous year. Thinning out the old wood, and annually renewing with young, is the plan to be adopted. The leading growths will require but little stopping after the plants are in bearing condition; but any strong or misplaced shoots should be removed. Black Currants should not be trained to fruit on spurs like the others, but they may be made to do so by subjecting them to the same system of pruning. The fruit for all purposes should be gathered, if possible, when dry. When required for preserving, it is better, if the weather is suitable, to wait several dry days before gathering. If for dessert, it is best gathered from the plants in fine weather as required. The trees should be carefully netted, without leaving any open spaces, or the birds will be sure to find them.

Insects, &c. Currants are subject to the ravages of all the caterpillars that prove so destructive to the Gooseberry, the trees being often entirely defoliated, excepting the petioles of the leaves. Hand-picking should be vigorously pursued as soon as any are detected, and the plants should be watered with an infusion of Hellebore leaves. Other caterpillars feed in the interior of the branches in spring, causing them to die away. The parts affected should be removed, and burned. Aphides are often found in large numbers on the points of the shoots; it is best to cut off and destroy these, or the insects will fall on the fruit, rendering it dirty and useless. Blackbirds and thrushes are the most destructive amongst birds as soon as the fruit is ripe. Carefully netting the plants is the only efficient protection, and this is always necessary if the fruit is to hang late for dessert.

Sorts. Names of Currants are very numerous, but the distinct varieties are somewhat limited, a great many being either synonyms or insufficiently distinct. The following are amongst the best in cultivation:

Black. BLACK NAPLES, large and good, but, being early in leaf, the fruit is sometimes liable to suffer from spring frosts, this is an old variety, well proved to be good for general cultivation; LEE'S PROLIFIC, distinct and comparatively new, the bunches are large, and the berries even larger than Black Naples, very sweet, and abundantly produced, an excellent black variety; OGDEN'S BLACK GRAPE, large and fine, very prolific; SWEET-FRUITED, a small sort, but little known, the fruit hangs longer on the trees, if protected, than most other Black varieties.

Red. CHERRY, a large, deep red, early Currant; HOUGHTON SEEDLING (Syn. *Houghton Castle*), a free-fruiting late variety, berries deep red, and very acid; KNIGHT'S LARGE RED (Syn. *Goliath*), berries bright red, bunches very large, and an abundant bearer; LA FERTILE, very prolific, large and good; LA HATIVE, a large, early, free-fruiting variety; MAMMOTH, one of the largest and best; RABY CASTLE, bunches long and large, berries bright red, with a sharp acidity, an abundant-fruiting late variety that hangs well; RED CHAMPAGNE, a very prolific variety, of a pale pink or flesh-colour, midway in flavour between the Red and White sorts; RED DUTCH, one of the best and most productive, and probably the one most cultivated, it ripens early, the berries are large, juicy, and of excellent quality; WARNER'S GRAPE, a good variety, with large bunches and berries.

White. WHITE DUTCH, this is the best of the White Currants, the plants have a dwarf, bushy habit, like the Red Dutch, the bunches and berries are large and freely produced, and of a mild, sweet flavour; WILMOT'S LARGE WHITE, a distinct variety, and a good cropper, but not so much grown as White Dutch.

CURRANT CATERPILLARS. *See* **Currant Clear-wing Moth, Gooseberry and Currant Sawfly,** and **Gooseberry or Magpie Moth.**

CURRANT CLEAR-WING MOTH (*Sesia tipuliformis*). This moth expands to about ⅝in. The wings are clear, except the veins, a border round the hind wings, the tip, and a spot in the centre of each of the fore wings, which are blackish. The antennæ are black, and are thickened towards the points. The body is black, with three fine yellow bands. The legs are black and yellow.

FIG. 573. CATERPILLAR OF CURRANT CLEAR-WING MOTH (SESIA TIPULIFORMIS).

These moths appear in July, and fly only when the sun shines. The larvæ (see Fig. 573) live inside the stems of Currant-bushes, and their presence is indicated by the drooping, sickly appearance of the leaves above the points attacked. The infested branches should be cut off and destroyed.

CURRANT, FLOWERING. *See* **Ribes sanguineum.**

CURRANT SAWFLY. *See* **Gooseberry and Currant Sawfly.**

CURTISIA (named after William Curtis, a celebrated English botanist, who founded the "Botanical Magazine"). Assagay-tree. ORD. *Cornaceæ*. A fine greenhouse tree. Calyx four-partite; petals four, oblong, valvate; stamens alternating with the petals. Fruit a small obovoid four (rarely three) celled drupe. It thrives in a compost of sandy loam and peat. Half-ripened cuttings will root in sandy soil, if placed under a hand glass, in gentle heat.

C. faginea (Beech-like). *fl.* pale, small, very numerous, in terminal, trichotomous, much-branched panicles. June and July. *l.* opposite, broadly ovate, toothed, shining above, ferruginous beneath. *h.* 20ft. to 40ft. Cape of Good Hope, 1775. The wood is solid, extremely tough, heavy, close-grained, very durable, and resembles plain mahogany.

CUSCUTA (etymology very doubtful). Dodder. SYN. *Pfeifferia*. ORD. *Convolvulaceæ*. Leafless, twining, parasitic herbs. Flowers in bracteate heads, rarely spicate; corolla urceolate or campanulate; limb five, rarely four-cleft, marcescent. The stalks twine contrary to the sun's apparent motion, sending out a number of little vesicles, which attach themselves to the supporting plant. The flowers of many species are extremely pretty and interesting, and, in some cases, very fragrant; but, from the peculiar habit of the plants, they will never become popular. All may be grown by simply sowing the seed with those of the plants they most affect, though some thrive on almost any plant. The following are the best:—STOVE: *americana, Hookeri, odorata,* and *verrucosa*. GREENHOUSE: *australis, chilensis, monogyna,* and *reflexa*. HARDY: *macrocarpa, Epilinum, Epithymum, europæa,* and *Trifolii*. The last four are British plants.

CUSCUTACEÆ. A group of leafless, parasitic, twining herbs, forming a division of *Convolvulaceæ*.

CUSHION PINK. *See* **Silene acaulis.**

CUSPIDARIA. Included under **Tænitis** (which *see*).

CUSPIDATE. When a leaf, &c., is suddenly narrowed at the top, and then more or less prolonged into an acumen or point.

CUSSONIA (named after Peter Cusson, 1727-1785, Jesuit and physician, a Professor of Botany in the University of Montpelier; his writings were principally on umbelliferous plants). ORD. *Araliaceæ*. A genus containing about a dozen species of greenhouse evergreen shrubs, natives of Eastern tropical and Southern Africa and the Mascarene Islands. Flowers greenish. Leaves glabrous, petiolate, palmate, with five to nine one-nerved, entire or lobed leaflets. Trunks thick, rather succulent. For culture, *see* **Argyreia.**

C. spicata (spiked). *fl.* spirally disposed along the rachis of the spike in five or six series. *l.* palmate; leaflets petiolate, variously and acutely cut, often trifid at the apex. *h.* 6ft. to 10ft. Cape of Good Hope, 1789.

C. thyrsiflora (thyrse-flowered). *fl.* racemose, pedicellate along the rachis. *l.* palmate; leaflets sessile, cuneiform, obtuse, truncate, tridentate. *h.* 6ft. to 12ft. Cape of Good Hope, 1795.

CUSTARD APPLE. *See* **Anona.**

CUTICLE. The outer pellicle of the epidermis.

CUTTING-IN. A term applied to the shortening of branches in shrubs and trees.

Cuttings—*continued.*

shoots that may be removed with a heel attached are often to be preferred. Roots are formed, in the majority of cases, at the node or joint only, and the incision should

FIG. 575. SOFT-WOODED CUTTING, VERBENA.

be made immediately below. See Fig. 574. Some plants, however, emit roots at any part of the stem that may be of suitable texture, and these may be cut as shown at Fig. 575. All Cuttings should be selected from healthy plants, and all or the greater part of their leaves retained. It is very important, when inserting, that the base should be placed in contact with the soil; and a layer of sand on the top tends to hold all firmly, until roots are

FIG. 574. SOFT-WOODED CUTTINGS PREPARED FOR INSERTING.

CUTTINGS. These are portions of a plant, usually the shoots, that are entirely detached, and may, or may not, be used for propagating purposes. A very large number of plants are kept true to character, and rapidly increased, by means of Cuttings. The perpetuation of distinct varieties that may have been obtained from seed, or from fixed sports, is often restricted to the same mode of propagation, as seed from these can seldom be depended on to reproduce the characters of the parent. Certain seasons and selected Cuttings are necessary to insure success with many plants; but with others the season is a matter of little importance, so long as other conditions are suitable. As a rule, these conditions vary very considerably. Cuttings of most soft-wooded plants require a higher temperature, and invariably a much closer atmosphere, than that in which they grow when established, to induce a speedy formation of roots, and, in the meantime, prevent an undue evaporation of moisture. Many hard-wooded exotics also require similar treatment, but in a lesser degree; while others that are hardier, and inserted when the wood is firm and growth inactive, require a longer time to form roots, and consequently a steadier temperature. Soft-wooded plants, to supply Cuttings in spring, should be placed in a little heat, to cause active growth, before they are inserted. Those of firmer growth are best when partially ripened, and side formed. *Coniferæ*, and hardy deciduous trees and shrubs, can generally be propagated by Cuttings. These are

FIG. 576. HARD-WOODED CUTTING, EUONYMUS JAPONICUS.

best prepared from the terminal shoot of a branch, as represented in Fig. 576, and inserted in early autumn, when

Cuttings—*continued.*

growth ceases, and the flow of sap is consequently less rapid. The length and size of Cuttings greatly depend on the variety of plant, those which are of medium growth, neither too sappy nor, on the other hand, too hard, being invariably preferred. Experience will alone teach the proper season, and the most successful method and suitable situation, for propagating by this method in different places, according to the various requirements of the plants to be increased, and the means at command for so doing. Shading, in spring and summer, is necessary in all cases, with tender Cuttings under glass, until they have formed roots.

Leaf Cuttings. Some plants may be increased by the insertion of a leaf with bud attached to the base. In the case of ornamental-leaved Begonias, Gloxinias, and others, young plants are obtained by the formation of bulbs on the petioles and midribs of the leaves, without the presence of an eye or bud. Cotyledons, and some other succulents, may be readily increased from leaves.

Root Cuttings refer to roots that ultimately form plants when cut in pieces and inserted in soil. This is a quick mode of propagating such plants as succeed. Clerodendrons and show Pelargoniums, amongst others, may be cited as examples.

For further information on Cuttings, *see* **Propagation.**

CYANANTHUS (from *kyanos*, blue, and *anthos*, a flower). ORD. *Campanulaceæ.* A small genus (six species) of brilliant-flowered alpine herbaceous perennials, of procumbent habit. They should be grown on rockwork, where their stems can nestle between the stones, and the roots find plenty of moisture, as in a dip or hollowed part, semi-shaded. The long and fleshy roots delight to run amongst damp leaf mould and sand. Cuttings may be taken during spring or early summer, and struck in sandy peat, kept moist; or strong roots may be carefully divided, in spring; the latter method, however, is the least desirable.

FIG. 577. CYANANTHUS INCANUS, showing Flowering Branch, and detached Flower from which Calyx and Corolla have been removed, in order to show Ovary crowned with the rayed Stigma, and surrounded by the Stamens at the base.

C. incanus (hoary). *fl.* soft azure-blue, terminal, 1in. to 1½in. long, ¾in. to 1in. across the corolla tube; limb segments oblong, spreading; throat lined with soft, white hairs. August. *l.* oval, slightly lobed, covered with soft white hairs. *h.* 3in. to 4in. Alpine Sikkim. This is a much rarer plant than *C. lobatus*, and rather more delicate. *See* Fig. 577.

C. lobatus (lobed). *fl.* bright purple-blue, few, solitary, usually terminal, about 1in. in diameter, funnel-shaped, with five tongue-shaped reflexed segments; throat covered with numerous soft, long, whitish hairs; calyx large, thickly set with short blackish hairs. August and September. *l.* small, fleshy, alternate, wedge-shaped, obovate, lobed. *h.* 4in. Alpine Himalayas, 1844. See Fig. 578. (B. M. 6485.)

Cyananthus—*continued.*

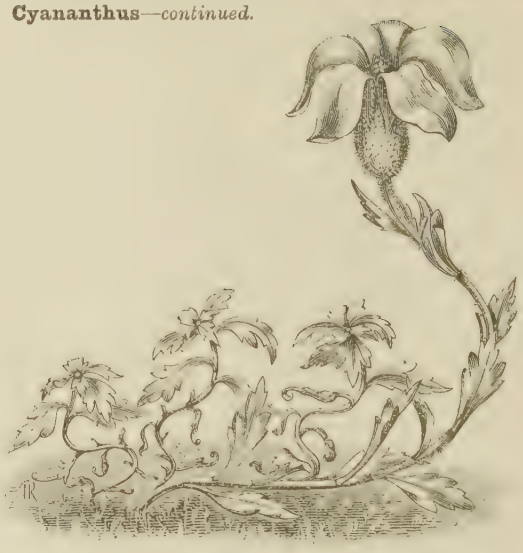


FIG. 578. CYANANTHUS LOBATUS.

CYANELLA (from the diminutive of *kyanos*, blue). ORD. *Liliaceæ.* Pretty little bulbous plants, from the Cape of Good Hope. Perianth segments six, the three lower ones hanging down; style and lowest stamen declinate. Capsule roundish, three-celled. Leaves radical, rarely cauline (attached to the base of the stem), lanceolate, or linear. For culture, &c., *see* **Ixia.**

C. capensis (Cape). *fl.* purple; racemes divaricating. July and August. *l.* lanceolate, wavy. Stem leafy, panicled. *h.* 1ft. 1768. (B. M. 568.)

C. lutea (yellow). This differs from *C. capensis* in having a stem with only one or two upright branches, instead of one with many branches and those horizontally spreading or divaricate; in the leaves not being undulate, and in having a larger and different-coloured corolla. *h.* 1ft. 1788. (B. M. 1252.)

C. odoratissima (very fragrant).* *fl.* deep rose, afterwards fading to a pale blush, very sweet-scented, on long peduncles, having a single bract below their middle; anthers yellow, the five upper spotted. July, August. *l.*, radical ones ensiform, straight, dark green; stem ones linear-lanceolate, acuminate. Stem erect, round, somewhat branched, flexuose. *h.* 1ft. This plant does not succeed in the open air, although it has been frequently reported as hardy. (B. R. 1111.)

Other species are: *alba* (white) and *orchidiformis* (blue).

CYANOPHYLLUM (from *kyanos*, blue, and *phyllon*, a leaf; referring to the under surface of the leaves). ORD. *Melastomaceæ.* Stove evergreens, with very beautiful foliage. The species thrive in a compost of good fibrous peat and leaf mould, in equal parts, with one-fourth of silver sand added. In potting, care should be taken that the drainage is perfect, as water must be given freely during summer, both to the roots and foliage; and a thoroughly moist atmosphere must be maintained, to prevent the leaves becoming deformed while they are immature. Propagation is effected by inserting cuttings and eyes in sand, where a good bottom heat can be maintained, and shade from the sun secured; they may also be readily increased by seeds, when these are procurable.

C. magnificum (magnificent).* *fl.* small, insignificant, disposed in a large branching panicle. *l.* broadly-ovate, tapering to a point, opposite, 1ft. to 2½ft. long, 9in. to 12in. wide; upper surface of a beautiful velvety-green, midrib and primary veins ivory-white; under side reddish-purple; veins very prominent. Mexico, 1858. This is one of the most beautiful foliage plants in cultivation, and fully bears out its specific designation. (R. H. 1859, 359.)

Cyanophyllum—*continued.*

C. spectandum (showy). *l.* large, oval, 10in. to 20in. long, 4in. to 7in. broad at the widest part; upper surface rich dark velvety-green, midrib margined with metallic grey; under side pale green, tinged with red, rib prominent. Brazil, 1866. Very handsome and distinct.

Other plants rightly or wrongly referred here in catalogues are: *assamicum*, *Bowmani*, and *speciosum*; they are, however, not worth cultivating where those described above are grown.

CYANOTIS (from *kyanos*, blue, and *ous*, an ear; alluding to the petals). SYN. *Tonningia*. ORD. *Commelinaceæ*. A genus containing about thirty species of pretty stove or greenhouse plants, allied to *Tradescantia*. Flowers nearly regular; perianth segments six; exterior ones nearly equal, navicular, connate at base; inner three long, petaloid, connate by the claws. Leaves various, small or middle-sized, sheathing at the base. Cyanotis require a rich loamy soil, and good drainage. They are propagated chiefly by young cuttings, inserted in sandy soil, in brisk heat. Several species are enumerated.

C. barbata (bearded). *fl.* dark blue; stamens with rather long, upright filaments, densely clothed with deep blue hairs. August. *l.* narrow. India, China, &c. Greenhouse perennial.

C. kewensis (Kew). *fl.* rose. Winter and spring. Malabar, 1874. Stove perennial creeper. SYN. *Erythrotis Beddomei*. (B. M. 6150.)

C. nodiflora (knot-flowered). *fl.* purple. South Africa, 1864. *l.* entire, strap-shaped, ciliate, sheathing at the base. *h.* 9in. to 1½ft. (B. M. 5471.)

CYATHEA (from *kyatheion*, a little cup; in reference to the appearance of the spores on the back of the fronds). ORD. *Filices*. Stove or greenhouse evergreen tree ferns. Fronds simple or pinnate, or decompoundly pinnate. Receptacle elevated, globose, or elongated; involucre globose, inferior, covering the whole sorus, afterwards breaking at the summit and forming a more or less persistent cup, even or regular at the margin. Sori on a vein, or in the axil of the forking of a vein. Stem often aculeated. For culture, *see* **Ferns.**

C. arborea (tree).* *sti.* and rachis pale brown. *fronds* large, bipinnate; secondary pinnæ 5in. to 8in. long, sessile, oblong-lanceolate, deeply pinnatifid or again pinnate; pinnules oblong, sub-falcate, serrated. West Indies, 1793. Unarmed, or copiously prickly. Stove. SYN. *C. Grevilleana*.

C. canaliculata (channelled). *fronds* glabrous, bipinnate; primary pinnæ 8in. to 18in. long, oblong, acuminate, bipinnate, and pinnatifid at the apex; pinnules sessile, 1in. to 1¼in. long, oblong, sub-acute, entire or serrated. *sori* copious, near the costa. Mauritius. Plant unarmed or indistinctly tuberculate. Stove.

C. Cunninghami (Cunningham's).* *cau.* 12ft. to 15ft. long. *sti.* and main rachises stramineous and asperous. *fronds* sub-coriaceous, flaccid, tripinnate; primary pinnæ 1½ft. to 2ft. long; secondary ones 3in. to 5in. long, oblong, acuminate, pinnatifid only at the apex; lobes or ultimate pinnules 4in. to 6in. long, linear, obtuse, pinnatifid; lobules entire. *sori* one to each lobe. New Zealand, 1860. Greenhouse.

C. dealbata (whitened).* *fronds* sub-coriaceous, bi-tripinnate; pinnæ oblong, acuminate, pure white beneath, deeply pinnatifid or pinnate at the base; lobes oblong, acute, falcate, serrated. *sori* copious, sometimes confined to the lower half of the lobes. New Zealand. Unarmed or slightly asperous. Greenhouse. See Fig. 579.

C. Dregei (Drege's). *fronds* bipinnate; pinnules sessile, 2in. to 3in. long, glabrous, narrow-oblong, acuminate, deeply pinnatifid; lobes oblong-ovate, sub-falcate, obtuse, more or less serrated. Natal, &c., 1873. Unarmed or only rough, with small tubercles at the base of the stipes. Stove. *C. Burkei* differs from this species in having the lobes of the pinnules rather broader.

C. excelsa (tall).* *fronds* bipinnate, coriaceo-membranaceous; primary pinnæ 2ft. long, 6in. to 8in. wide; pinnules 3in. to 4in. long, ½in. wide, sessile, deeply pinnatifid, sub-pinnate at the base; lobes oblong, obliquely sub-acute, serrated, scaleless. *sori* in the fork near the costa. Mauritius, 1825. Unarmed. Greenhouse or stove.

C. Grevilleana (Greville's). Synonymous with *C. arborea*.

C. Hookeri (Hooker's). *cau.* 1½in. thick. *sti.* short. *fronds* coriaceo-membranaceous, 2ft. to 3ft. long, 4in. to 5in. wide, elongato-lanceolate, acuminate, pinnate, pinnatifid at the apex; pinnæ sub-linear-lanceolate, acuminate, sub-sessile, coarsely dentato-pinnatifid. *sori* dorsal on the veins or in the lower axils. Ceylon, 1873. Stove.

C. insignis (remarkable).* *sti.* scaly. *fronds* ample, coriaceous; primary pinnæ 8ft. long; secondary ones 7in. to 8in. long, elongato-oblong, finely acuminated, sessile, pinnatifid nearly to the costa; lobes oblong-falcate, obtuse, quite entire, the margin slightly reflexed. *sori* copious. Jamaica. Stove. SYNS. *C. princeps* and *Cibotium princeps*.

C. integra (entire).* *fronds* firm-membranaceous, brownish-green, paler beneath; primary pinnæ ample, 1½ft. long; pinnules sessile or petiolate, 3in. to 5in. long, from a truncated base, oblong-acuminate, pinnatifid nearly two-thirds of the way to the costa, broad-oblong, sub-falcate, acute, serrated. *sori* in two series between the costule and margin. Amboyna and Philippine Islands. Unarmed. Stove. SYN. *C. petiolata*.

C. medullaris (pithy).* *cau.* tall. *fronds* ample, bi-tripinnate, coriaceous; secondary pinnæ 5in. to 6in. long, about 1in. broad, deeply pinnatifid or again pinnate; pinnules oblong or linear-oblong, obtuse, coarsely serrated in the sterile specimens, lobato-pinnatifid in the fertile ones, with the margins revolute. *sori* one to each lobule of the pinnule. New Zealand. Greenhouse.

C. petiolata (petiolate). Synonymous with *C. integra*.

C. princeps (princely). Synonymous with *C. insignis*.

FIG. 579. CYATHEA DEALBATA.

C. Serra (saw-toothed).* *sti.* thicker than a finger, muricated; scales dense, large, whitish. *fronds* bipinnate; pinnules lanceolate, deeply pinnatifid, 6in. to 8in. long, lanceolate, acuminate; lobes linear-oblong, acute, serrated, falcate. *sori* generally covering the whole of the lobes. West Indies, &c. Stove.

C. sinuata (sinuate). *cau.* slender, erect, 2ft. to 4ft. long. *fronds* simple, 2ft. to 3ft. long, 1in. to 2½in. wide, elongato-lanceolate, sinuated at the margin, acuminate, tapering into a short stipe at the base. Ceylon, 1861. Stove. SYN. *Schizocæna sinuata*.

CYATHODES (from *kyathos*, a cup, and *odons*, a tooth; in reference to the disk, which is cup-shaped and five-toothed). ORD. *Epacrideæ*. A genus containing thirteen species, of which four are from New Zealand, two from the Sandwich Islands, and the others from Australia. Ornamental erect-branched greenhouse evergreen shrubs, with the habit of small trees. Flowers axillary, erect, or drooping a little, small; corolla funnel-shaped; limb spreading. They thrive in peat. Cuttings will root in sand, with a little peat, if placed under glass.

C. acerosa (needle-like). *fl.* white. April and May. *l.* linear-spreading, with naked margins, three to five-nerved beneath. *h.* 8ft. Victoria and Tasmania, 1823. SYN. *C. Oxycedrus*.

Cyathodes—*continued.*

C. glauca (milky-green).* *fl.* white. April to June. *l.* crowded at intervals, somewhat verticillate, spreading or divaricate, linear-lanceolate. *h.* 25ft. Tasmania, 1818. Tree.

C. Oxycedrus (Prickly Cedar). A synonym of *C. acerosa.*

CYBELE. A synonym of **Stenocarpus** (which *see*).

CYCADACEÆ. An order of small Palm-like trees or shrubs, closely related to *Coniferæ*, usually with unbranched stems, "marked with leaf-scars, and having large rays in the wood along with punctated ligneous tubes." Flowers naked; males in cones; females, consisting only of ovules, on the edge of altered leaves, or placed below or at the base of scales. Seeds hard, or with a soft spongy covering. Leaves pinnate. The order embraces nine genera. Examples: *Cycas, Dioon, Encephalartos, Zamia.*

FIG. 580. CYCAS CIRCINALIS.

CYCAS (the Greek name for a Palm). ORD. *Cycadaceæ.* Stove herbaceous perennials. Male flowers in cones, consisting of scales, bearing anthers on their inner surface. "The female plants bear in the centre of the crown of leaves surmounting the stem, a tuft of woolly pinnately-cleft leaves, in the notches of whose margins the naked or uncovered ovules are placed" (Masters). Stem cylindrical, usually unbranched, terminated at the top by a fine crown of deeply-cut pinnate leaves. They thrive in strong loam and river sand, in moist heat. The pots must be well-drained to prevent any stagnation. Propagation is effected by seeds; and young plants are obtained from suckers, which are occasionally thrown up. For small gardens, the two species *circinalis* and *revoluta*, will be found quite

Cycas—*continued.*

sufficient, as the remainder are, for the most part, distinct only in minor details. The handsome appearance of these plants renders them excellent subjects for decorating either stove, greenhouse, or conservatory; and few subjects are more graceful for the sub-tropical garden than an old specimen of *C. revoluta*, when placed in a warm and sheltered position, where it may be allowed to remain from May till September.

C. circinalis (crook-leaved).* *l.* dark shining green on the upper side, paler below, 6ft. to 12ft. long, pinnate; pinnæ falcate, from 6in. to 12in. long. Stem stout, cylindrical, increasing in size very slowly. Stem of male plant somewhat slender, frequently two to three times divided. East Indies, 1800. See Fig. 580. (B. M. 2826, 2827.)

C. media (middle).* *l.* elliptic-lanceolate, pinnate; pinnæ very numerous, linear, acuminate, lower ones abbreviated and passing into spines; petioles and rachis nearly plane on the upper side, and convex beneath. Trunk stout and tall, cylindrical, bearing a very fine head of large leaves. North Australia and Queensland, 1874. (I. H. 1879, 368.)

C. Normanbyana (Normanby's).* *l.* oblong-ovate, pinnate; pinnæ numerous, contiguous, linear, about 6in. long, ¼in. wide, acutely pointed, slightly narrowed and decurrent at the base; petioles dorsally compressed, with both faces angular and the base clothed with furfuraceous down. New South Wales, 1875.

C. revoluta (rolled back).* *l.* dark green, pinnate, 2ft. to 6ft. long. Stems very stout, bearing a very handsome crown of leaves. China, 1737. In old plants, the stem is sometimes 7ft. high, and then branches, thus presenting a very unique and massive appearance. (B. M. 2963, 2964.)

C. Riuminiana (Riumini's). *l.* erect, spreading towards the apex, pinnate; pinnæ tapering to a fine point, rich bright green. Stem moderately stout. Philippine Islands, 1864. A rare but handsome species. (I. H. 405.)

C. Rumphii (Rumphius'). *l.* pinnate, 4ft. to 6ft. long; pinnæ 6in. to 10in. long, hardly 1in. broad, linear, lanceolate, pale green, texture thin; naked part of the petioles armed with a double row of short spines. Stem slender; summit bearing the crown of leaves. Indian Archipelago.

C. siamensis (Siamese). *l.* about 30in. in length, oblong, pinnately divided into about sixty-five pairs and one terminal segment, all linear-lanceolate, abruptly spine-pointed at the apex, and decurrent at the base along the rachis, which is puberulous and rounded. Stem stout. Cochin China, 1878. This species closely resembles *C. circinalis.* (I. H. 433.)

CYCLAMEN (from *kyklos*, circular; referring to the spiral peduncle). Sowbread. ORD. *Primulaceæ.* A very distinct genus of greenhouse and hardy plants, with circular compressed perennial rootstocks, from which the leaves and flowers spring. Calyx five-partite; corolla tube short; limb large, deeply lobed; lobes reflexed. Leaves all radical, petioled, broad. The hardy species are beautiful dwarf-flowering subjects, well adapted for growing in well-drained positions on a rockery, or, in the case of those sufficiently plentiful, for naturalising in the grass by woodland drives, where it is cool and shady. *C. neapolitanum* succeeds if treated in this way. It flowers profusely in early autumn, at first destitute of leaves, and, at this season, produces a pretty effect. The very numerous varieties, so much cultivated in pots, are the offspring of *C. persicum.* By selection and good culture, these have been already brought to a high state of perfection, and new varieties, of vigorous growth and with distinctly-coloured massive flowers, are still annually selected.

Propagation of Cyclamens, whether species or varieties, is effected by seed, which are never in better condition for sowing than when freshly gathered. The hardy kinds should be sown in pots and placed in a cool frame. As soon as the seedlings appear, they should be grown on in a frame until sufficiently strong to be placed out in their permanent positions. A well-drained soil is essential, and a sheltered situation, with protection in winter, is to be preferred. All varieties reproduce themselves tolerably true from seed, if kept isolated when in flower, to prevent cross-fertilisation.

Cyclamen—*continued.*

Cultivation in Pots. Few plants are better adapted to pot culture for winter and spring decoration than varieties of *C. persicum* (see Fig. 586), and few produce such a profusion of flowers in return for the moderate amount of care bestowed. A system of completely drying off in summer was once thought a good plan; but this has now been abandoned by all good cultivators as most unnatural, and the plants are grown from the seedling to the flowering stage without a check of this sort. Seeds are best sown in the autumn, as, if left until spring, a loss of time is effected in the growth of the plants that are intended to flower the following winter or spring. Ordinary pots or pans should be filled with a compost of light sandy soil, the seed placed thinly over the surface, then pressed in, and slightly covered. A temperature of 55deg. will be sufficient to insure germination, the time occupied varying according to the age of the seed. When the seedlings appear, they must be raised near the light, to prevent them becoming drawn, and, as soon as large enough, pricked off—several in a 5in. pot—and kept like this in a similar temperature till spring. They may then be placed singly in 3in. pots, and grown on in frames during the summer, with plenty of air after becoming established, and also shading from bright sunshine. By July, most of the pots will be filled with roots, and the plants should then be shifted into others, 5in. or 6in. in diameter, in which they will flower. Good

FIG. 581. CYCLAMEN PERSICUM, showing Rootstock and Mode of Rooting.

drainage must be insured, and a compost used of equal parts loam and leaf soil, not, in any case, adding rank manure. The roots proceed from the base of the fleshy rootstock (see Fig. 581), and this should be about half-

FIG. 582. CYCLAMEN PERSICUM, showing Rootstock and Manner of Flowering.

Cyclamen—*continued.*

covered with soil, leaving the tops clear whence the flowers and leaves proceed (see Fig. 582). The after cultivation consists chiefly in keeping the plants, at all times, in a light airy place, near the glass, to prevent drawing, and thereby weakening them. Shade in bright weather only, apply water liberally, and syringe on fine afternoons, to keep the plants clean and encourage growth.

Cyclamens may be grown on a second year by drying moderately and resting for a time, afterwards reducing and repotting. They should receive similar treatment to that previously advised for young plants, but the flowers are generally earlier and smaller a second year. It is not advisable to save plants after this age, as seed sown each year will keep up a stock, and young plants are much to be preferred. If no seed is required, the flowers should be removed when over.

Insects. Cyclamens are particularly subject to injury from Green Fly, Red Spider, and Thrips, at all stages of growth. Neither must be allowed to obtain a footing, or the leaves will soon become curled and irreparably injured. Fumigating frequently, but not too strongly, will destroy fly and many of the Thrips. Sponging the leaves, or dipping them in soft soap water, and afterwards in clean water, is the best remedy for clearing Cyclamens of spider. These pests should be frequently looked for, and, when first observed, measures at once taken to arrest their progress.

C. africanum (African).* *fl.* white or red tinted, with a bright purple spot at the base; corolla segments oblong-spathulate, auricled at the base, ⅜in. to 1in. long. September and October. *l.* fully developed in December, cordate, orbicular, reaching a length and breadth of 6in. to 8in., with both large deltoid teeth and copious irregular intermediate smaller ones, thin in texture, and beautifully marbled with white. Tuber very large, with fibres from all over the surface. *h.* 4in. to 6in. Calcareous Mountains of Algeria. This very fine plant is closely allied to *C. neapolitanum*, and, according to Mr. Baker, is but a subspecies or geographical race of it. (B. M. 5758.)

C. cilicicum (Cilician).* *fl.*, corolla segments pure white, with a bright purple basal blotch, oblong-spathulate, acute, not auricled at the base. October. *l.* developed at the same time as the flowers, sub-orbicular, entire, with close basal lobes. Rootstock a large regular depresso-globose tuber, with the slender root fibres in a tuft from its base. *h.* 4in. Cilicia, 1872. This species somewhat resembles *C. europæum*, but may be distinguished from that by its calyx segments.

FIG. 583. CYCLAMEN COUM.

C. Coum (Coum).* *fl.* usually deep red, inodorous; corolla the smallest of all the species, with oblong-spathulate segments. February and March. *l.* cotemporary with the flowers, with a shorter petiole than in any of the others, quite orbicular, firm in texture, neither lobed nor toothed, nor variegated with white, tinted purple beneath. Rootstock a depresso-globose tuber, with slender root fibres in a tuft from the base. *h.* 4in. South Europe and Asia Minor. See Fig. 583. (B. M. 4.) The two principal varieties of this in cultivation are *C. album*, with white, and *C. carneum*, with rose-red, corolla segments. *C. orbiculatum*, given by some authorities as a species, is doubtless a variety of this.

Cyclamen—*continued.*

FIG. 584. FLOWER, BUD, AND LEAF OF CYCLAMEN EUROPÆUM.

C. europæum (European). *fl.* bright red, very fragrant; corolla segments oblong-spathulate, ½in. to ¾in. long. August to October. *l.* produced at the same time as the flowers, ovate-orbicular, deeply cordate at the base, with close lobes, moderately firm in texture, marbled with white above, tinted with purple beneath, entire or minutely crenulate, always without large deltoid teeth. Rootstock a depresso-globose regular tuber, with slender fibres from all over its lower half, the tufts of leaves and flowers often connected with it by a rhizome 2in. or 3in. long. *h.* 4in. Central and Southern Europe, widely dispersed, 1596. See Fig. 584. *C. Clusii* (B. R. 1013), *C. littorale* (B. R. 1846, 56), and *C. Peakianum* (F. M. 262) are Italian forms of this species, with much longer and more delicate flowers.

C. græcum (Greek). *fl.* pure white, with a bright purple spot at the base; corolla segments oblong-spathulate, auricled at the base, ½in. to ¾in. long. September and October. *l.* not developed till after the flowers, cordate-orbicular, obtuse, small, firm in texture for the genus, irregularly denticulate, but without large deltoid teeth, distinctly zoned with white above, and tinted with purple beneath. Tuber large, red, often irregular in form, with a few fibres in a tuft from its base. Mountains of Greece. A well marked species, not unlike *C. neapolitanum*, but quite different in leaves and tuber.

C. ibericum (Iberian).* *fl.* bright red in the type, with a bright purple spot at the base; corolla segments oblong-spathulate. February and March. *l.* cotemporary with the flowers, ovate-orbicular, very obtuse, entire or faintly undulated at the edge, firm in texture, distinctly zoned with white. Tuber globose, larger than in *C. Coum*, with the slender root-fibres in a tuft from the base. *h.* 3in. Caucasus, 1831. This, according to Mr. Baker, is but a sub-species or geographical race of *C. Coum*, but far superior to it for decorative purposes. (S. B. F. G. 9, under name of *C. vernum*). There is a fine garden variety, *C. Atkinsii*, raised by Mr. Atkins, of Painswick; and a form having large pure white flowers, with a bright-coloured purple spot at the base of each segment (figured in F. d. S. 2425).

C. neapolitanum (Neapolitan).* *fl.* white or red, with a bright violet-purple spot at the base; corolla segments oblong-spathulate, with a distinct auricle on both sides at the base, ½in. to ¾in. long. August and September. *l.* developed before the flowers disappear, cordate, ovate, finally 3in. to 4in. long and broad, very variable in shape, thin in texture, usually furnished with several large deltoid teeth, and often, but not always, with minute small ones. Rootstock a very large depresso-globose tuber, sometimes attaining 1ft. in diameter, with fibres produced from all over its surface. Central and Southern Europe, widely dispersed; naturalised in several places in Britain. See Fig. 585.

C. persicum (Persian).* *fl.* inodorous in the type; corolla the largest of all the species; segments white in the type, with a bright claret-purple blotch at the base, oblong-spathulate, not auricled at the base. March and April. *l.* cotemporary with the flowers, ovate, irregularly crenate on the margin, moderately firm in texture, distinctly variegated with white. Rootstock a depresso-globose regular tuber, much larger than in *C. Coum*, with a dense mass of fibres from all over the under side. *h.* 6in. Greece, Palestine, and other parts of Syria, 1731. This is the finest of all the species. See Figs. 581 and 582. There are a large number of garden varieties (see Fig. 586), the most striking of which are figured in F. M. 2435. *C. album punctatum*, *C. alepicum*, and *C. giganteum*, are merely garden forms of this species.

Cyclamen—*continued.*

FIG. 585. CYCLAMEN NEAPOLITANUM, showing Single Flower, Bud, and Habit.

C. repandum (repand). *fl.* rose-red, with a bright purple basal spot; corolla segments ½in. to ¾in. long, oblong-spathulate, not auricled at the base. March to May. *l.* cotemporary with the flowers, ovate-deltoid, cordate at the base, with an open sinus, thin in texture, zoned with white, tinged with purple beneath. Rootstock a small globose tuber, with a few slender fibres in a tuft from its base. South Europe. (B. M. 1001, under the name *C. hederæfolium*.)

FIG. 586. CYCLAMEN PERSICUM, GARDEN VARIETY.

Varieties Mixed seed from a good strain are best for general cultivation, as they can be procured much cheaper, and the produce represents a much greater diversity of colour, than would be obtained from a few named varieties. These latter, in many cases, soon become superseded by still better selections, and are of most use to seed-raisers for fixing a select strain. What is termed the *giganteum* type is one that has flowers of immense size, but less in number. The flowers in this and the ordinary section vary in colour from pure white to dark purple, and some have two or more colours beautifully blended.

CYCLOBOTHRA. *See* **Calochortus.**

CYCLODIUM. *See* **Aspidium.**

CYCLOGYNE. Included under **Swainsona** (which *see*).

CYCLONEMA MYRICOIDES. *See* **Clerodendron myricoides.**

CYCLOPELTIS. *See* **Aspidium.**

CYCNOCHES (from *kyknos*, a swan, and *auchen*, a neck; in reference to the long and gracefully curved column). Swan Neck. ORD. *Orchideæ*. The species of this genus are deciduous. Flowers large, produced from nearly the top of the bulb. Pseudo-bulbs thick and fleshy, 6in. to 10in. high, with three or four leaves on the top of each. Propagation is effected by dividing the bulbs when they commence to start into growth. For cultural and structural remarks, *see* **Catasetum.**

C. aureum (golden).* *fl.* light yellow, disposed in long, closely-set racemes. *h.* 1ft. Central America, 1851. A remarkable and handsome species. (P. F. G. 75.)

C. barbatum (bearded).* *fl.* small, but very pretty; sepals and petals greenish-white, spotted with pink; lip the same colour, and beautifully fringed. June. New Grenada. Very scarce. (B. M. 4479.)

C. chlorochilum (greenish-yellow-lipped).* *fl.* large, very fragrant; sepals and petals yellowish-green; lip lighter. June, July. *h.* 2ft. Demerara, 1838.

C. Egertonianum (Egerton's).* *fl.* dark purple; sepals and petals membranaceous, recurved; disk of lip roundish, broken into clavate processes; column slender, very long; raceme pendulous, very long. Autumn. *h.* 2ft. Mexico, 1835. (G. C. 1843, 775.)

C. Lehmanni (Lehmann's).* *fl.*, sepals salmon-coloured; petals and lip orange; peduncle many-flowered. *l.* long, petioled, cuneate, oblong acute, very strong. Pseudo-bulbs about 7in. long, elongate, pear-shaped, furrowed. Columbia, 1880. SYN. *Luddemannia Lehmanni*.

C. Loddigesii (Loddiges').* *fl.* 4in. across; sepals and petals of a brownish-green colour, with darker spots, and bearing some resemblance to the expanded wings of a swan; spikes three or four-flowered. Surinam, 1830. Very curious and desirable. (B. M. 4215.)

C. maculatum (spotted). *fl.* buff-colour, thickly spotted with purple; numerously produced on a long raceme. Pseudo-bulbs very short. *h.* 1ft. Mexico, 1839. (I. H. 20, 143.)

C. musciferum (fly-bearing). *fl.* pale brown; sepals linear-lanceolate, dorsal one refracted; petals linear; lip membranous, hastate; lateral segments linear, ascending, middle one bearded at base, tongue-formed at apex; racemes loose. Early spring. *h.* 1ft. Columbia, 1849. (P. F. G. iii. 29, 248.)

C. pentadactylon (five-fingered). *fl.* very large; sepals and petals pale yellow, tinged with green, with broad chocolate-coloured blotches; lip of the same colour, divided into five parts, like a man's hand. *h.* 1ft. Brazil, 1841. Very curious. (B. R. 29, 22.)

C. ventricosum (inflated). *fl.* very sweet-scented; sepals and petals greenish-yellow, with a white lip. July, August. *h.* 2ft. Guatemala, 1835.

C. Warscewiczii (Warscewicz's).* *fl.* green, those on one spike much larger and totally different in appearance one from the other, so much so that, seen separately, they would be taken as belonging to different genera; the flowers on the shorter spike, with the broad segments and simple lip, are probably female, while the smaller and more numerous flowers on the long raceme, and which have a much-divided lip, are male. 1879. (G. C. n. s., xii. 493.)

CYDONIA (from *Kydon*, in Crete, where the tree grew in large numbers, and where, perhaps, the Greeks first became acquainted with it). Quince. ORD. *Rosaceæ*. Hardy deciduous trees and shrubs. Flowers large, either solitary, or few together in a kind of umbel. Pome closed, five-celled; cells cartilaginous, many-seeded; seed covered with mucilaginous pulp. Leaves undivided, quite entire, or serrated. For culture, &c., *see* **Quince.**

C. chinensis (Chinese). *fl.* light rose-colour; calyx five-parted, reflexed, downy inside. Spring. *l.* stalked, coriaceous, oval, finely serrated. China. Small tree or large shrub. (B. R. 905.)

C. japonica (Japanese).* *fl.* deep scarlet, solitary, or two or three together, produced the greater part of the year; calyx glabrous; lobes short, obtuse, entire. *fr.* green, very fragrant, but not edible, ripening in October. *l.* oval, somewhat cuneated, crenate-serrated, quite glabrous on both surfaces; stipules reniform, serrated. *h.* 5ft. to 6ft. Japan, 1815. "One of the most desirable deciduous shrubs in cultivation, whether as a bush in the open lawn, trained against a wall, or treated as an ornamental hedge plant. It has also been trained up with a single stem as a standard; and, in this character, its pendent branches and numerous flowers give it a rich and striking appearance, especially in early spring. It is difficult to unite with its congeners by grafting; but, if it could be grafted standard high on the Pear, the Hawthorn, or even the common Quince, it would form a most delightful little tree. Readily propagated by layers or suckers, and it also grows by cuttings." See Fig. 587. There are many varieties, including a white, as well as a double red-flowered form.

Cydonia—*continued.*

C. Maulei (Maule's).* *fl.* bright red. April. *fr.* golden-yellow, produced in great abundance, agreeably perfumed, but exceedingly acid to the taste; it, however, makes an excellent conserve. *l.* somewhat smaller than those of *C. japonica*, and plant dwarfer and more compact in habit. Japan, 1874. One of the most beautiful of recently introduced shrubs. SYN. *Pyrus Maulei*. (B. M. 6780.)

FIG. 587. CYDONIA JAPONICA, showing Flowering Branch, Fruit, and Single Flower.

C. vulgaris (common). Common Quince. *fl.* white or pale red, large, few, disposed in a kind of umbel. May or June. *fr.* varying in shape in different varieties, glandular, oblong, ovate, or obovate; it has a peculiar and rather pleasant apple-like smell, and an austere taste. *l.* ovate, blunt at the base, quite entire, clothed with white tomentum beneath, as well as the calyces and pedicels. *h.* 20ft. South Europe, 1573. (Enc. T. and S. 450.) *See also* **Quince.**

FIG. 588. FRUITING BRANCH OF CYDONIA VULGARIS LUSITANICA (PORTUGAL QUINCE).

C. v. lusitanica (Portuguese). Portugal Quince. This has broader leaves and larger fruit than the two under-mentioned kinds; and, being of more vigorous growth, it is better adapted for use as a stock for Pears. See Fig. 588.

C. v. maliformis (apple-shaped). *fr.* apple-shaped.

C. v. pyriformis (pear-shaped). *fr.* pear-shaped.

CYLINDRICAL. Cylinder-shaped; round.

CYLISTA (from *kylix*; in reference to the calyx being very large). ORD. *Leguminosæ*. A stove evergreen woody twiner, with axillary simple racemes of yellow flowers, pinnately-trifoliolate leaves, and rhomboid or ovate, acute, stipellate leaflets; bracts large, caducous.

Cylista—*continued.*

It thrives in a compost of loam and peat. Cuttings will root in sand, if placed in bottom heat, and covered with a glass.

C. albiflora (white-flowered). A synonym of *Rhynchosia cyanosperma albiflora.*

C. scariosa (scarious). *fl.* pale yellow, mixed with red; calyx very large, scarious, with the upper segment emarginate, lower one very large. East Indies, 1806.

CYMBIDIUM (from *kymbe*, a boat; referring to a hollow recess in the lip). ORD. *Orchideæ.* A genus of about thirty species of stove orchids, for the most part natives of India, the Malayan Archipelago, and China, two species are African, three Australian, one New Caledonian, and one Japanese. Many of them have small and inconspicuous flowers; but a sufficient number of handsome species are to be found in the genus to induce the cultivator to have it well represented in any house, however small. Their characteristic features are to be found in the long, narrow, sword-shaped leaves, and in the labellum, which is ornamented with a pair of curved elevated lines on the lower part; the sepals and petals are linear-oblong. When once established, Cymbidiums are not difficult to grow; but, on account of their thick fleshy roots, they are by no means easy to restore, if imported in a bad state. They succeed best cultivated in pots, and should be placed in a compost of good rough peat, sphagnum, and a little sharp sand. The thin-leaved kinds, especially, must never be dried, or the loss of many leaves will, as a consequence, follow, to the great disfigurement of the plants; but it should be borne in mind that there must be a great difference made in the quantity supplied during the summer and winter. Cymbidiums, when not growing, should be kept somewhat cool, and plenty of fresh air given at all times, avoiding cold chills.

Cymbidium—*continued.*

C. affine (kindred). *fl.* white, with a few purplish dots on the anterior of the lip; racemes many-flowered. *l.* linear-acuminate, rigid. India, 1878. (F. M. n. s. 346.)

C. aloifolium (Aloe-leaved). *fl.* rich pale purple, with a long, almost black, stripe down the centre; spikes drooping, many-flowered. September. *l.* very thick and fleshy. *h.* 1ft. East, Indies, 1789. (L. B. C. 967.)

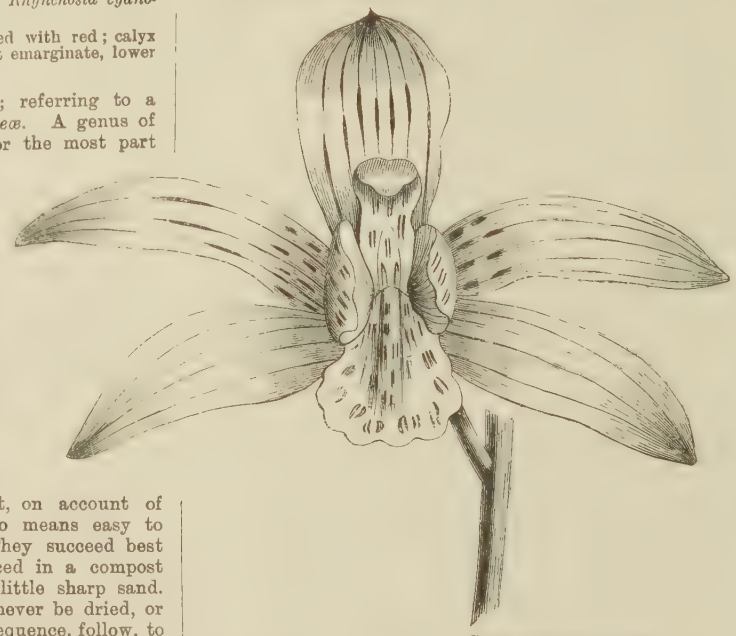


FIG. 590. FLOWER OF CYMBIDIUM GIGANTEUM.

C. bicolor (two-coloured).* *fl.* resembling those of *C. aloifolium*, but distinguished from that species by the presence of a sac at the bottom of the lip, and also a number of stains and stripes of very deep crimson. April. Ceylon, 1837.

C. canaliculatum (channelled).* *fl.*, sepals and petals purplish-brown, edged with green; lip greenish-white, with a row of pink spots just within the edge; racemes drooping, bearing numerous moderate-sized flowers. April. *l.* broadly linear-elongate, keeled. Stem short, compressed, almost pseudo-bulbous. North-eastern Australia, 1870. (B. M. 5851.)

C. Dayanum (Day's).* *fl.* yellowish-white, marked with port-wine coloured streaks on the middle lines of sepals and petals, and a similar border and numerous small streaks on the lip; racemes many-flowered, pendulous. *l.* about 4ft. long, narrow. Assam. 1869.

C. Devonianum (Duke of Devonshire's).* *fl.*, sepals and petals light brown, with dull mauve-purple streaks and blotches; lip white, with numerous dark purple lines and blotches, the acute, reflexed, anterior part wholly of a fine dark purple, almost rhomboid; racemes nodding, many-flowered. *l.* lanceolate-oblong, acute, with long channelled petioles. India, 1837. (P. M. B. 10, 97.)

C. eburneum (ivory).* *fl.* deliciously fragrant, very handsome, large, Tulip-like; sepals ivory-white; petal and lip stained with pale yellow; racemes erect, usually one (but sometimes two) flowered. February. *l.* narrow, sword-shaped, distichous, bright light green. With age, this very rare species forms a stout stem-like pseudo-bulb, but, when young, it shows no sign of this. East Indies, 1846. See Fig. 589. (B. R. 33, 67.) There are one or two varieties.

FIG. 589. CYMBIDIUM EBURNEUM.

Cymbidium—*continued.*

C. giganteum (gigantic).* *fl.* large; sepals and petals brown; lip brown, stained with yellow and blotched with purple; racemes erect, many-flowered. Winter and spring, lasting several weeks in beauty. The plant has a distinct pseudo-bulb, which is clothed with the broad sheathing bases of the long sword-like leaves. Northern India, 1837. A strong and bold-growing species, but somewhat shy at flowering. See Fig. 590. (P. M. B. xii. 241.)

C. Hookerianum (Hooker's).* *fl.* very large, upwards of 4in. in diameter; sepals and petals green; lip straw-coloured, deep yellow at the margins, round which are large blotches of rich purple; racemes erect. Sikkim Himalayas, 1866. A fine cool-house species, similar to *C. giganteum* in habit, but striped with greenish-yellow at base of the leaves. (B. M. 5574.)

C. Huttoni (Hutton's).* *fl.* rather large; petals wholly of a deep chocolate-colour; sepals and lip thickly marked with transverse chocolate-coloured bars on a whitish ground; racemes long drooping, radical. *l.* twin, coriaceous, nerveless. Pseudo-bulbs elongated. Java, 1857. A very distinct species. (B. M. 5676.)

C. Leachianum (Leach's).* *fl.*, sepals and petals ligulate, acute, whitish-ochre colour, with a brown line running nearly to the apex; lip nearly totally brown except the whitish disk with two keels, three-lobed; racemes loose. *l.* linear-lanceolate, acute. Formosa, 1878.

C. longifolium (long-leaved). *fl.* olive-green, brown, whitish. November. India, 1873.

C. Lowianum (Low's).* *fl.* large; sepals and petals green, with a few faint sepia-brown lines over the strongest nerves; lip whitish-yellow; disk of anterior lacinia in the beginning purple, later maroon brownish-purple, with a very narrow pallid border, a few spots at base of lip. March. Burmah, 1877. (G. C. n. s., xi. 405.)

C. Mastersii (Masters').* *fl.* pure ivory-white, saving a stain of pink on the lip, and with a fragrance like that of almonds; racemes erect, many-flowered. Winter. Assam, 1841. In general appearance, the growth of this species resembles *C. eburneum*, but the leaves are longer, broader, and more recurved, and are destitute of the close sheathing base which is a striking feature in that plant. (Gn., May, 1884.) There are one or more varieties of this species.

C. ochroleucum. *See* **Camaridium ochroleucum.**

C. Parishii (Parish's).* A very rare and beautiful species. Described as follows: sepals and petals ivory-white; lip with an orange middle zone, and an orange disk to the anterior lobe, both painted with purplish-brown spots. The side lobes of the lip have numerous spots of a most lively purplish-violet, which give the chief charm to the flower. The back side of the column is white, the edges are yellow, and the front side is yellow, with some brownish-purple spots on the foot. Peduncle two or three-flowered. *l.* ligulate, narrow, acute. Burmah, 1874. (W. O. A. 25.)

C. pendulum (pendulous). *fl.*, sepals and petals brown; lip red, striped with white; racemes long, drooping, from 1ft. to 2ft. in length, many-flowered. July and August. *l.* erect, long, narrow, thick, leathery, dark green. Nepaul, 1838. A large-growing plant. (B. R. 26, 25.)

C. p. purpureum (purple).* A very handsome variety, producing racemes from 2ft. to 3ft. long; sepals and petals of a rich deep red; lip white, with crimson markings. East Indies, 1868.

C. sinense (Chinese).* *fl.* deliciously fragrant; sepals and petals brown and purple; lip yellowish-green, spotted with purple; racemes tall, erect, many-flowered. China, 1793. (L. B. C. 37.)

C. tigrinum (striped). *fl.* large; sepals and petals greenish-yellow, spotted with red; lip large, tapering to a point, middle portion white, striped with cross bars of purple, sides of the lip also purple. *l.* about 6in. long. Pseudo-bulbs nearly round. Tenasserim, 1864. (B. M. 5457.)

CYMBIFORM. Boat-shaped.

CYMBURUS. A synonym of **Stachytarpheta** (which *see*).

CYME. An inflorescence which is branched and centrifugal, the central flower always opening first. Example: *Cerastium.*

CYNANCHUM (from *kynos*, a dog, and *ancho*, to strangle; in allusion to the poisonous properties of some species). SYN. *Symphyoglossum.* ORD. *Asclepiadeæ.* A genus containing about eighteen species of twining herbs or sub-shrubs, natives of South Europe, Africa, Asia, and Australia. Umbels interpetiolar; corolla sub-rotate, five-parted; corona membranous, forming a loose cup or tube round the anthers; anthers terminated by a membrane. Leaves opposite. The following species are of very easy culture in ordinary garden soil; and are readily propagated by dividing the roots, in spring.

C. acutum (acute). *fl.* white or rose-coloured, scented, in small, stalked, axillary or terminal umbels. July. *l.* lanceolate, deeply cordate at the base. *h.* 2ft. to 12ft. South Europe, &c. Hardy climber.

C. nigrum (black). A synonym of *Vincetoxicum nigrum.*

C. pilosum (pilose). A synonym of *Vincetoxicum pilosum.*

Cynanchum—*continued.*

C. roseum (rosy).* *fl.* rosy-red. Summer. *l.* shortly stalked, narrow-linear. *h.* 1ft. to 1½ft. Western Asia. Hardy perennial. SYN. *Cycoctonum roseum.*

C. Vincetoxicum (Vincetoxicum). A synonym of *Vincetoxicum officinale.*

CYNARA (from *kyon*, a dog; the spines of the involucre being likened to dogs' teeth). Artichoke. ORD. *Compositæ.* A genus containing about six species of hardy herbaceous thistle-like perennials, natives of the Mediterranean region and Canary Islands. Involucre broad or sub-globose; coriaceous bracts in many series; receptacle fleshy, flat, densely setose; pappus hairs many-seriate, plumose. Although some of these are much more generally grown for economic purposes than for floricultural ornament, few plants are more stately or effective when planted in the backgrounds of borders or the outskirts of shrubberies. For culture and propagation, *see* **Artichoke (Globe)** and **Cardoon.**

C. Cardunculus. Cardoon. *fl.-heads* purple; scales of involucre ovate. August and September. *l.* spiny, all pinnatifid. *h.* 5ft. South Europe, 1658. (B. M. 3241.)

C. horrida (horrid). *fl.-heads* purple. August and September. *l.* pinnatifid, downy beneath, spiny; spines of the base of leaves and pinnæ connate at base. *h.* 6ft. South Europe, &c., 1768. (S. F. G. 834.)

C. Scolymus. Globe Artichoke. *fl.-heads* purple, very large; involucre consisting of oval-obtuse, sometimes emarginate, downy scales. Autumn. *l.* long, nearly pinnatifid, somewhat spiny; under surface covered with white cottony down. *h.* 3ft. to 6ft. 1548. This is not a species, but merely a cultivated form of *C. Cardunculus*; it is nowhere found wild.

CYNIPS. *See* **Galls.**

CYNIPS ROSÆ. *See* **Rose-Galls.**

CYNOCRAMBE. A synonym of **Thelygonum** (which *see*).

CYNOGLOSSUM (from *kyon*, *kunos*, a dog, and *glossa*, a tongue; in allusion to the form of the leaves of most species). Hound's Tongue. ORD. *Boragineæ.* Tall, robust, downy biennials or perennials, soft to the touch. Racemes usually bractless, secund, terminal, simple, bifid, or twin; corolla funnel-shaped or sub-rotate; throat closed by prominent scales. Leaves large, broadest at top. All the species are coarse-growing, but the flowers of some are very pretty. For culture, *see* **Dipsacus.**

C. cheirifolium (Wallflower-leaved). *fl.*, corolla rose-coloured, processes of the throat deep red; racemes bracteate, terminal, simple. June and July. *l.* lanceolate, obtuse, tomentose, hoary. *h.* 6in. to 12in. South Europe, 1596. Biennial.

C. Dioscoridis (Dioscorides'). *fl.*, corolla red or flesh-coloured, with deeper veins; racemes elongated, bractless, loose, usually terminal. June. *l.* narrow-lanceolate, acuminated, dilated at the base, rather hispid. *h.* 1½ft. to 2ft. South-west Europe, 1820. Biennial.

C. officinale (officinal). *fl.*, corolla reddish; processes of the throat purple; racemes bractless, panicled at the time the flowers are open, terminating the branches and stem. June. *l.*, lower ones broad-lanceolate; superior ones broadest at the base, acute, canescent from downy tomentum. *h.* 2ft. Europe (Britain). Biennial.

C. o. bicolor (two-coloured). *fl.*, corolla white, with the processes in the throat red, and the limb marked with five red spots. *l.* lanceolate, narrowed at the base, downy; upper ones sessile, cordate. Germany. Biennial.

C. pictum (painted). *fl.*, corolla purple or blue, elegantly marked with deeper-coloured, dichotomous veins, which are branched at top; racemes bractless. August. *l.* lanceolate, acute; upper ones ovate-lanceolate, cordate, finely tomentose. Stem bluntly angular. *h.* 2ft. South Europe, 1658. Biennial. (B. M. 2134.)

C. virginicum (Virginian). *fl.*, corolla pale blue; racemes bractless. July. *l.*, lower ones somewhat spathulate-lanceolate; superior ones clasping by a deep heart-shaped base, lanceolate-oblong, acute; smoothish above and shining, but scabrous beneath. *h.* 2ft. to 5ft. United States. Perennial.

CYNOMETRA (from *kyon*, a dog, and *metra*, a matrix; in reference to the shape and consistence of the pods). ORD. *Leguminosæ.* Stove evergreen trees. Flowers red, rising from the main trunk of the tree. Legumes brown, edible. Leaves abruptly pinnate, consisting of a single pair of leaflets. About twenty species are known to science; they are distributed over the tropical portions of both hemispheres. For culture, *see* **Copaifera.**

Cynometra—*continued.*

C. cauliflora (stem-flowering). *fl.* white; racemes rising in fascicles from the trunk, sometimes short and few-flowered, sometimes elongated and many-flowered. *l.*, leaflets emarginate at the apex. *h.* 30ft. to 40ft. East Indies, 1804.

CYPELLA (from *kypellon*, a goblet or cup; referring to the form of the flowers). SYN. *Polia.* ORD. *Irideæ* Very pretty little half-hardy bulbous plants, comparatively rare in cultivation. Perianth segments free; outer ones obovate, spreading; inner ones much narrower, erect, with recurved apices. Leaves plicate. Bulbs tunicated. They thrive in light soil, in a moderately sheltered position. If the roots are allowed to remain in the ground during winter, ample protection must be afforded; but it is generally more satisfactory to lift them, and plant again in spring. Propagated by offsets; or by seed, sown as soon as ripe, in a cool house.

C. cærulea. *See* **Marica cærulea.**

C. Herberti (Herbert's).* *fl.* yellow, varying from a light shade to a deep chrome tint, sparingly produced on a stalk; perianth segments ovate at the tip, somewhat contracted in the middle, and spotted or barred with a deeper colour at the base. July. *l.* lanceolate, tapering. *h.* 1ft. Buenos Ayres, 1823. (B. M. 2599, under the name of *Tigridia Herberti.*)

C. peruviana (Peruvian). *fl.* two to three in a solitary stalked terminal cluster, fugacious, and appearing in succession from the spathe; limb bright yellow, spotted at the base with red-brown; stigma bright yellow, bifid, petaloid. *l.*, stem ones glabrous, linear, papyraceous, plicate; basal ones vanished by the time the plant flowers. Bulb ovoid, tunicate. Andes of Peru, 1874. A very handsome species. (B. M. 6213.)

C. plumbea (leaden-coloured). *fl.* lead-coloured, tinged with yellow in the centre, solitary, widely expanded, very fugacious, lasting only a few hours; stigma consisting of short, two-lobed, transverse, tender lobes. Autumn. *l.* distant, sword-shaped, plicate. Stem slender, 3ft. or more high. Mexico, 1838. A very remarkable plant. (B. M. 3710, under the name of *Phalocallis plumbea.*)

CYPERACEÆ. An extensive order of grass-like tufted plants, with solid, usually jointed, and frequently angular, stems. Leaves with their sheaths entire. The order contains few genera of horticultural value; but the following include species worth notice: *Carex*, *Cyperus*, *Papyrus*, and *Scirpus.*

CYPERUS (from a Grecian appellation given to one of the species of this genus). Including *Trentepohlia.* ORD. *Cyperaceæ.* A genus of about 700 species of perennial (rarely annual) rush or grass-like herbs, of various habit. Flowers bisexual, glumaceous; spikes two-ranked, many-flowered; glumes of one valve, keeled, mostly all fertile, equal; bristles none; stamens one to three. Leaves narrow, grass-like. Of the enormous number of species belonging to this genus, the following are amongst the only ones generally cultivated; these are valuable for decorative purposes. They may be grown in small pots, in a compost of loam and sand, with the addition of a little peat. Plenty of moisture is essential. Propagation is effected either by divisions, or by seed, sown in gentle heat.

C. alternifolius (alternate-leaved).* Stems erect, numerous, dark green, jointless, supporting a quantity of long narrow leaves, arranged in an umbellate manner. *h.* 1ft. to 2½ft. Australia. The habit of this elegant greenhouse plant is very compact. It constitutes an excellent window subject. Perennial.

C. a. variegatus (variegated).* A very pleasing form. Stems and leaves elegantly streaked with white, and sometimes wholly white. It is very useful for cutting, as well as for vase and table decoration. *h.* 1½ft. Greenhouse perennial.

C. laxus (loose). *fl.*, spikelets oblong, bluntish, greenish, or greenish-brown, six to sixteen-flowered; glumes roundish-elliptical, mucronate, with a greenish spreading point. Stem triangular, glabrous. *h.* 2ft. to 3ft. West Indies. This perennial plant is well adapted for table decoration; and, to grow it successfully, requires to be placed in a damp greenhouse. (G. C. n. s., ii. 99.)

C. longus (long).* *fl.*, panicle umbellate-corymbose, lax; spikelets linear, attenuated at each end; glumes three to five-nerved. always erect, chestnut-red, with a green midrib. Autumn. *l.* two or three, in the lower half of the stem, grooved above, or sharply keeled beneath, scabrous at the edges, bright green and shining above, pale beneath; sheaths reddish-brown at the base. Stem solitary, erect, triquetrous, stiff. *h.* 2ft. to 4ft. Europe and North Africa. England (but rare), in marshes and wet meadows; abundant in the Channel Isles. An elegant perennial plant for margins of lakes, &c. (Sy. En. B. 1578.)

CYPHIA (from *kyphos*, curved; in reference to the stigma being gibbous). ORD. *Campanulaceæ.* A genus containing about a score species of half-hardy perennial herbaceous plants, natives (with the exception of one from Abyssinia) of the Cape of Good Hope. Corolla bilabiate; segments easily separated to the base, spreading at the apex. Leaves alternate, undivided, pinnate, and pinnatifid. They thrive in an equal mixture of loam, peat, and sand. Cuttings will root readily under a hand glass, in a cool house. Some species have large tuberous roots, which must be kept quite dry when not in a growing state, or they will rot. They may be increased just as the stems begin to push out from the root, by cutting off as many of the shoots as are required, and placing them in a small pot, in the soil recommended above, with plenty of sand. The young plants should be kept dry till callused, but not covered with glass. They will soon form tubers of themselves, and the old plants will make fresh shoots.

C. bulbosa (bulbous). *fl.* pale blue. August. *l.* digitate; lower ones pinnatifid, with unequal lanceolate lobes; upper ones often simple. Stem rarely branched. *h.* 6in. 1791.

C. Cardamines (Cardamine-like). *fl.* racemose, on very short pedicels. July. *l.* pinnate, with ovate, toothed leaflets. Stem scape-formed, simple. *h.* 6in. 1823.

C. Phyteuma (Rampion). *fl.* pink; scape erect. February. *l.* oblong, crenated, ciliated. *h.* 3in. 1822. (B. R. 625.)

C. volubilis (twining). *fl.* axillary, solitary, pedicellate; corolla pale blue, ringent or bilabiate, about 1in. long. *l.* entire and toothed, linear. Stems filiform, twining contrary to the sun's apparent motion. 1795.

CYPHOKENTIA (from *kyphos*, a tumour, and *Kentia*; a Kentia-like Palm, having a lateral protuberance on the fruit). ORD. *Palmeæ.* For cultivation, *see* **Areca.**

C. robusta (robust)* is described as a very elegant plant, with pinnately-divided spineless foliage. New Caledonia, 1878.

CYPHOMANDRA (from *kyphoma*, a hump, and *aner*, a man; in allusion to the anthers forming a hump). SYN. *Pionandra.* ORD. *Solanaceæ.* In this genus there are about twenty-four species, all natives of South America. The only one worthy of mention here is *C. betacea*, which is a handsome greenhouse shrub, thriving in a compost of loam and leaf mould. Propagated by seed; or by cuttings, placed under a hand glass, in bottom heat.

C. betacea (esculent). *fl.* in long pendulous racemes, when in bud purple, then greenish; when fully expanded green, with a dark streak on the back of each segment. *fr.* reddish when ripe, egg-shaped; an excellent substitute for tomatoes. *l.* somewhat succulent, stalked, shortly acuminate, entire, glossy dark green. Stem erect, arborescent, finally attaining a height of 12ft. to 14ft. South Brazil, 1836. SYN. *Solanum fragrans.* (B. M. 3684.)

CYPHOSPERMA (from *kyphos*, a hump, and *sperma*, seed; in allusion to the form of the seed). ORD. *Palmæ.* A genus containing a couple of species of unarmed stove Palms, with stout annulated stems; both are natives of New Caledonia. The second species has not yet been introduced to cultivation, and that described below is much better known under its garden name of *Kentia robusta.* For culture, *see* **Areca.**

C. Viellardii (Viellard's). *l.* pinnatisect; segments coriaceous, elongate-ensiform. New Caledonia. SYNS. *Kentia robusta* and *K. Viellardii.*

CYPRESS. *See* **Cupressus.**

CYPRIPEDIUM (from *Kypris*, Venus, and *podion*, a slipper). Lady's Slipper. ORD. *Orchideæ.* This is one of the most interesting and important genera of the whole Orchid family, whether viewed from a botanical or horticultural point of view. One characteristic of the vast majority of orchids is the possession of only one perfect stamen, the two lateral ones being abortive. To this rule *Cypripedium* forms an exception, possessing, as it does, two fertile lateral stamens, the central one (which is fertile in other orchids) being represented by a singular shield-like plate. The large inflated pouch which is formed by the labellum suggested both English and Latin names. This pouch plays a considerable part in securing the fertilisation of the flower.

Cypripedium—*continued.*

Sir John Lubbock, speaking of *C. longifolium*, says: "The opening into the slipper is small, and partly closed by the stigma and the shield-like body which lies between the two anthers. The result is that the opening into the slipper has a horseshoe-like form, and that bees or other insects which have once entered the slipper have some difficulty in getting out again. While endeavouring to do so, they can hardly fail to come in contact with the stigma, which lies under the shield-like representation of the middle anther. As the margins of the lip are inflected, the easiest exit is at the two ends of the horseshoes, and by one or other of these the insect generally escapes; in doing which, however, it almost inevitably comes in contact with, and carries off, some of the pollen from the corresponding anther. The pollen of this genus is immersed in a viscid fluid, by means of which it adheres first to the insect, and secondly to the stigma, while in most orchids it is the stigma that is viscid."

Reference has already been made to the remarkable pouch by which the flowers are characterised: it may be added that the petals and sepals are narrow and rather long, extending sometimes into slender tail-like appendages of great length. The blossoms are, in different species, yellowish, pink, or white; in some instances, they are beautifully dotted and lined with pink or green, and in many kinds purple and brown, of various shades, are the predominating colours.

All amateur plant growers who are about to commence orchid growing, should begin with a few of the commoner species of Lady's Slipper, for the following reasons: they are not expensive, or difficult to cultivate, but thrive admirably amongst ordinary stove plants; they flower very freely, and continue in perfection a long time. Some blossom in mid-winter, others during the summer months; and those who wish for fine exhibition subjects cannot have more attractive or telling plants.

Cultivation. Although Cypripediums are very easily cultivated, they differ from the majority of orchidaceous plants, inasmuch as they do not, in potting, require to be elevated above the rim of the pot, but inserted in the same manner as ordinary plants. The best soil for them is a mixture of two parts good peat, one part chopped sphagnum, one part thoroughly decayed leaf mould, and a portion of sharp silver sand. In potting, an important point for consideration is drainage. This must be thorough and effective, for, as these plants have no pseudo-bulbs to sustain them, they must not be dried off, as many other orchids are, during winter; and, if the drainage is defective, the roots are sure to decay and the leaves shrivel. In the case of the hardier kinds of Lady's Slipper, a large portion of good friable loam, in addition to the above soil, is recommended. It has been frequently said that deciduous species of *Cypripedium* are very difficult to cultivate; but, with a suitable rather shady position and a little care, they will thrive as well as many other herbaceous plants.

C. acaule (stemless).* *fl.* solitary, large; sepals and petals greenish, shorter than the drooping lip, which is of a beautiful warm rose, blotched with purple. May and June. *l.* twin, broad, light green, sparingly clothed with short soft downy hairs; from their centre arises the short scape. Northern United States, 1786. An extremely rare species, of great hardihood. (B. M. 192.) A white-flowered variety also occurs.

C. Argus (Argus).* *fl.* white, rose, green, blackish-purple, and purple-brown March and April. *l.* handsomely tessellated with grey. *h.* 1ft. Philippines, 1873. Stove. (B. H. 1882, 9.)

C. arietinum. Ram's-head.* *fl.* solitary; sepals and petals greenish-brown; lip red and whitish-veined. May. Stems leafy, stiff. *h.* 7in. to 10in. Northern United States and Canada, 1808. A neat little hardy species. (B. M. 1569.)

C. Ashburtoniæ (Lady Ashburton's).* *fl.*, dorsal sepal large, and not unlike *C. barbatum*; petals ligulate, white, tinged with green, and veined with purple; lip pale purple, tinged with yellow, and

Cypripedium—*continued.*

slightly blotched with purple. *l.* ligulate, dark green, faintly reticulated. Stove. A handsome hybrid, raised from *C. barbatum* and *C. insigne*. (G. C. n. s., 1871, 1647.)

C. barbatum (bearded).* *fl.* solitary; dorsal sepal large and broad, the lower portion beautifully flecked with purple, the upper half pure white; petals similar in colour, ornamented with several tufts of black hairs, which are produced from the purple shining warts bordering the upper edge of the petals; lip large, blackish-purple. Spring and summer. *l.* distichous, oblong, light green, curiously blotched and spotted with irregular markings of very dark green. *h.* 1ft. Malacca, 1838. Stove. This is about

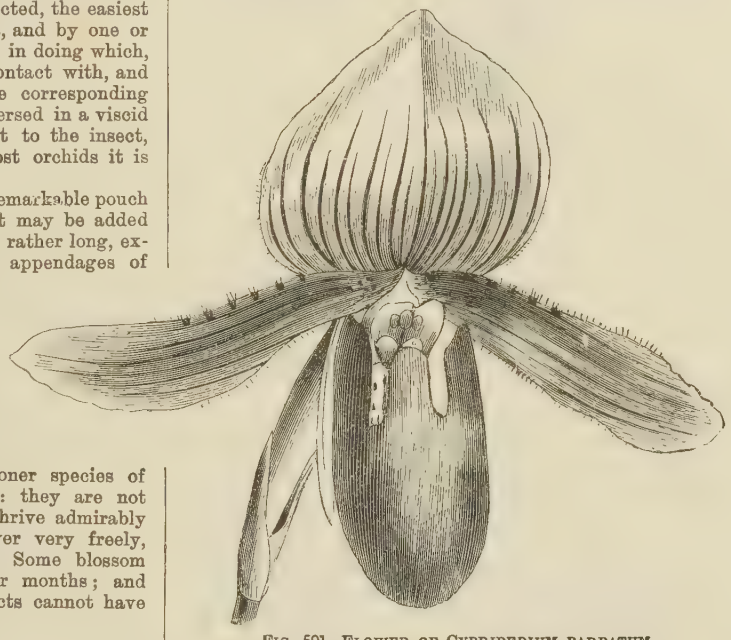


FIG. 591. FLOWER OF CYPRIPEDIUM BARBATUM.

the most familiar species of the genus. See Fig. 591. (B. M. 4234.) There are numerous forms of the species, which vary considerably in the peculiar mottling of the leaves, and in the size and brilliancy of the colouring of their blossoms, so that, to insure a good typical form, intending purchasers should make their selection whilst the plants are in flower. The following are the best varieties:

C. b. nigrum (black). *fl.* larger than those of any other form of the type, and the colour much darker. The foliage is finely variegated. It continues six weeks in flower.

C. b. superbum (superb).* Much like the type, but with brightly variegated foliage, flowers more handsome, lip very dark, and the dorsal sepal purer white towards the apex.

C. b. Veitchianum (Veitch's).* A very fine form, with spotted petals.

C. biflorum (two-flowered). *fl.*, dorsal sepal very handsome, upper part white; remaining parts of the blossom purplish-brown; spikes nearly 1ft. long. *l.* elegantly variegated. *h.* 4in. India. Stove. Allied to *C. barbatum*.

C. Boxallii (Boxall's).* *fl.*, upper sepal of a beautiful fresh light green, with a narrow white border, covered with brownish-black spots; inferior sepal oblong-acute, shorter than the lip, light green, with lines of very small reddish-brown spots; petals broadly cuneate at the base, dilated at the apex, blunt, light green, with a dark, rather broad bluish-violet line from the base of the middle line up to near the apex; lip chiefly forming a blunt conical sac, with two channelled upright horns and a channelled claw, greenish-yellow, with a dense row of cinnamon spots under the orifice of the sac. Peduncle covered with dark blotches. India, 1877. Stove. (I. H. 345.)

C. Calceolus.* Common Slipper. *fl.* usually solitary; sepals and petals narrow, spreading, reddish-brown or maroon colour; labellum pale yellow. *l.* glabrous, dark green. *h.* 12in. to 18in. North Asia and Europe (England). Hardy. See Fig. 592. (G. C. n. s., xi. 813.)

C. calurum. *See* **Selenipedium calurum.**

C. candidum (white).* *fl.*, sepals and petals greenish-brown; lip white. Early summer. *h.* 12in. North America, 1826. A neat and pretty species. Hardy. (B. M. 5855.)

C. caricinum. *See* **Selenipedium caricinum.**

Cypripedium—*continued.*

FIG. 592. CYPRIPEDIUM CALCEOLUS.

C. concolor (one-coloured).* *fl.* cream-coloured, finely speckled, borne in pairs on dark brown stems. *l.* beautifully variegated. Moulmein, 1865. A very distinct stove species. See Fig. 593. (B. M. 5513.)

FIG. 593. CYPRIPEDIUM CONCOLOR.

C. Crossii (Cross's). *fl.*, dorsal sepal large, ground colour whitish, with a purplish blotch in the centre, from which spring lines of the same colour; lower half of sepal marked with green lines; lateral sepals whitish, lined with green, tipped reddish-purple; lip reddish-purple. *l.* light green, blotched with darker colour. Peru, 1864. (B. H. 1865, 226.)

C. Dayanum (Day's).* *fl.* large; sepals white, with green veins; petals purplish, tinged with green. May, June. *l.* with very beautifully distinct variegation. Borneo, 1860. Stove. (F. d. S. 1527.)

C. Dominianum. *See* **Selenipedium Dominianum.**

Cypripedium—*continued.*

C. Druryi (Drury's).* *fl.*, sepals greenish-yellow, covered outside with numerous dark hairs, middle line broad, black; petals broad, ligulate, bent a little downwards, each equally adorned with a broad black line over the middle; lip ochraceous, with numerous brown spots on its channelled base. *h.* 6in. India, 1877. This stove species has the general habit of *C. insigne*, but the leaves are more acute and usually shorter, and the flower is very different.

C. euryandrum (large-anthered).* A very distinct hybrid between *C. barbatum* and *C. Stonei*. The sepals come near those of the latter, but the upper one is more blunt; petals ligulate, rather broad, much longer than those of *C. barbatum*, much shorter than those of *C. Stonei*; the lip comes near that of *C. barbatum*, but is larger. (F. d. S. 2278, 2279.)

FIG. 594. CYPRIPEDIUM FAIRIEANUM.

C. Fairieanum (Fairie's).* *fl.* solitary; dorsal sepal large, white, beautifully streaked with green and brownish-purple; petals similar in colour and curiously curved at the ends; lip rather large, dull purple, suffused with dull brown and shaded with green. *l.* about 3in. long, narrow, pale green. *h.* 1ft. East Indies. The flowers are produced in great abundance, and will last several weeks in full beauty if not sprinkled with water. It thrives best in a cool house. See Fig. 594. (B. M. 5024.)

C. guttatum (spotted).* *fl.* beautiful snow-white, heavily blotched or marbled with deep rosy-purple, rather small. June. *l.* twin, broadly-ovate, downy. *h.* 6in. to 9in. Northern Russia, Siberia, and North America, 1829. A very charming but rare hardy species, thriving in a shady position on rockwork or in a border, in leaf mould, moss, and sand; it must be kept rather dry in winter. (P. F. G. 1, 183.)

C. Harrisianum (Harris's).* A hybrid between *C. barbatum* and *C. villosum*. *fl.* larger than those of the first-named, yet inferior in size to *C. villosum*; upper sepal broad, shining, dark purple, tipped with white; petals rich purple; lip claret-coloured, tipped with green. *l.* marked like those of *C. barbatum*, with the polished appearance of *C. villosum*.

C. Haynaldianum (Haynald's).* *fl.*, upper half of upper sepal faintly rose and white, lower greenish, beautifully blotched with brown; inferior sepal pale green, slightly spotted brown; lip green, with a rounded base; raceme two or more flowered. Winter. Philippines, 1877. This species comes very close to *C. Lowii*. (B. M. 6296.)

C. Hincksianum. *See* **Selenipedium Hincksianum.**

C. hirsutissimum (very hairy). *fl.* often 6in. across, solitary or in pairs, on erect hairy scapes; sepals and petals green, shaded with purple, and dotted with brown; lip greenish, with a profusion of brown dots. March to May. *l.* pale green, about 10in. long. *h.* 1ft. Java. Less showy than many others, but well worth growing. Stove. (B. M. 4990.)

C. Hookeræ (Mrs. Hooker's).* *fl.* solitary, on very long scapes; sepals and petals yellowish-brown, the points of the latter being of a rich rosy-purple; the pouch is somewhat small, brown, suffused with yellow. Summer. *l.* broad, obtuse; ground-colour deep black-green, beautifully variegated with irregular-shaped blotches of pure white. Borneo, 1868. Stove. (B. M. 5362.)

Cypripedium—*continued.*

C. insigne (remarkable).* *fl.* solitary, often 5in. across; dorsal sepal broad, large, yellowish-green, faintly streaked with lines of reddish-brown, and the upper part pure white; lip large, tawny-yellow, paler within. Winter, lasting several weeks in beauty. *l.* long, strap-shaped, yellowish-green, coriaceous, distichous. Nepaul, 1819. A well-known and useful greenhouse plant. See Fig. 595. (B. M. 3412.)

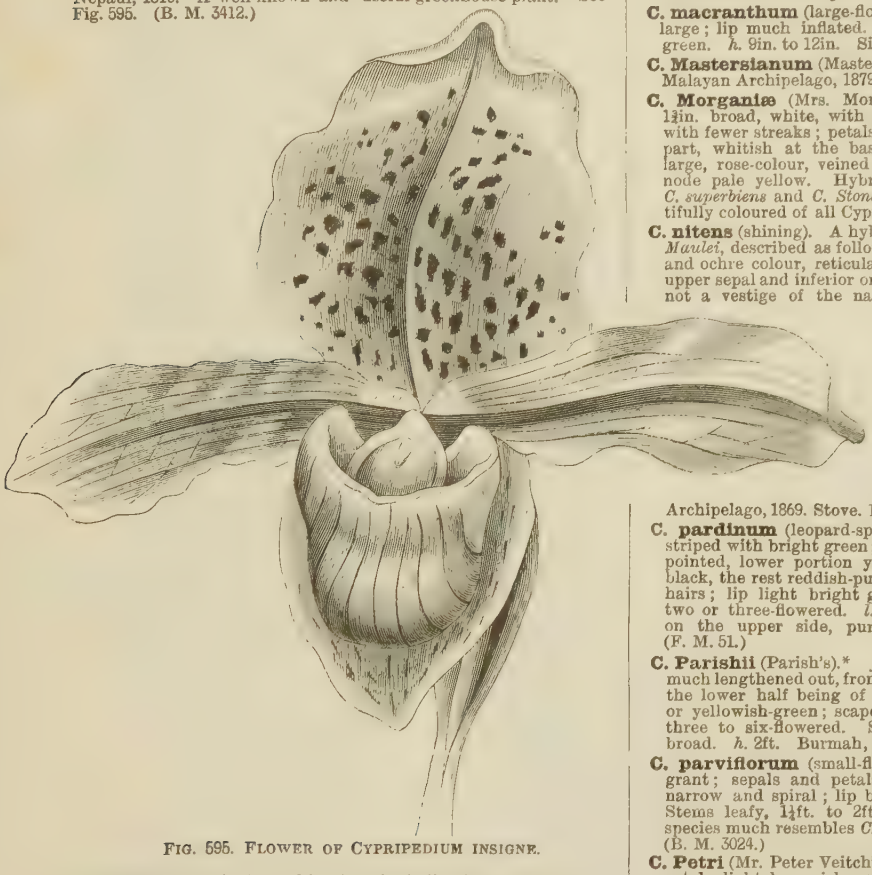


FIG. 595. FLOWER OF CYPRIPEDIUM INSIGNE.

C. i. Maulei (Maule's).* This, though similar in general appearance to the type, is nevertheless distinct and beautiful; it is somewhat more delicate in its habit of growth. The flowers are produced at the same season of the year, but are much brighter in colour, the dorsal sepal being spotted dull purple, and fully half is snow white. Nepaul. (G. C. n. s., xviii. 716.)

C. i. punctatum violaceum (violet-dotted). This differs from *C. i. Maulei* in its roundish-oblong, flat, dorsal sepal, and in the more definite colouring of the whole flower. Lip smaller, shining chestnut colour; petals light olive-green, shaded and netted with dark umber. (Gn., June 24, 1882.)

C. irapeanum (Irapean). *fl.* about 4in. in diameter; sepals and petals of a uniform rich golden-yellow; lip same colour, stained on the inside with reddish-brown, much inflated; spikes many-flowered. June, July. *l.* broad, pale green, sheathing the stem at the base. *h.* 18in. Mexico, 1844. Stove. (B. R. 1846, 58.)

C. japonicum (Japanese). *fl.* solitary; sepals greenish, covered with red spots; petals and lip white, stained and tinged with crimson, forming a lovely contrast of colours. June. *l.* large, twin, cordate, with crumpled edges, light green. *h.* 6in. to 1ft. Japan, 1874. Hardy. Distinct and uncommon. (G. C. n. s., iii. 625.)

C. lævigatum (smooth).* *fl.*, sepals striped inside with purple; petals 6in. long, very much twisted, beautifully blotched with chocolate, purple, and green; lip yellow; scape hairy, three or four-flowered. Spring. *l.* strap-shaped, long, thick, shining. Philippines, 1865. A very handsome stove species. SYN. *C. philippinense.* (B. M. 5508.)

C. Lawrenceanum (Lawrence's).* *fl.*, upper sepal very broad and round, much exceeding a half-crown piece, white, with numerous dark purplish, shining veins; lateral sepals very small, greenish-white, with dark purple spots; petals divaricate, narrow, green, dull purplish at the top, ciliate; lip very large. *l.* about 1ft. long, having on their inner surface a dark green mosaic on a light greenish-white ground. Borneo, 1878. Stove. (B. M. 6432.)

C. Lowii (Low's).* *fl.*, dorsal sepal downy outside, pale green within; petals long, the basal half greenish, spotted with purple, wholly purple towards the end; margins ciliated; lip large, smooth, and shining, bluntly-oblong, light brown in colour, suffused with purple; spike generally two-flowered, sometimes more. *l.* oblong-ligulate, light green. Borneo, 1847. A curious and beautiful stove species. (G. C. 1847, 765.)

C. macranthum (large-flowered).* *fl.* deep rich purple, solitary, large; lip much inflated. May, June. *l.* medium-sized, bright green. *h.* 9in. to 12in. Siberia, 1829. Hardy. (B. M. 2938.)

C. Mastersianum (Masters's). *fl.* green, white, coppery, brown. Malayan Archipelago, 1879.

C. Morganiæ (Mrs. Morgan's). *fl.*, dorsal sepal 2½in. long by 1¾in. broad, white, with purplish streaks; lower sepal smaller, with fewer streaks; petals 5in. long and 1in. broad at the widest part, whitish at the base, spotted with reddish-crimson; lip large, rose-colour, veined with crimson, whitish beneath; staminode pale yellow. Hybrid raised by Messrs. Veitch between *C. superbiens* and *C. Stonei.* One of the largest and most beautifully coloured of all Cypripediums. (Gn., Jan. 20, 1883.)

C. nitens (shining). A hybrid between *C. villosum* and *C. insigne Maulei*, described as follows: "Petals long, wavy, light brown, and ochre colour, reticulate, very shining, as in *C. villosum*, the upper sepal and inferior one quite as in *C. Maulei*, but far larger; not a vestige of the narrow base of the superior one, as in *C. villosum*; lip with long lateral horns of sac, and narrower, in the way of *C. villosum.*"

C. niveum (snowy).* *fl.* wholly of a pure soft snowy white, save for a few freckles of cinnamon irregularly scattered over the sepals and petals, usually solitary, rarely twin. *l.* dark green on the upper side, irregularly blotched with lighter markings, the under side of a dull vinous red. *h.* 6in. Malay Archipelago, 1869. Stove. Described as one of the best. (B. M. 5922.)

C. pardinum (leopard-spotted).* *fl.* large; dorsal sepal white, striped with bright green; lower sepal smaller; petals broad and pointed, lower portion yellowish-green, spotted with purplish-black, the rest reddish-purple, and fringed at the edges with fine hairs; lip light bright green, tinged with pale yellow; spike two or three-flowered. *l.* mottled with various shades of green on the upper side, purplish beneath. India, 1869. Stove. (F. M. 51.)

C. Parishii (Parish's).* *fl.*, sepals greenish-white, broad; petals much lengthened out, from 4in. to 5in. long, beautifully undulated, the lower half being of a rich purple; lip 1½in. long, purplish or yellowish-green; scape sometimes 2ft. high, much-branched, three to six-flowered. Summer. *l.* distichous, leathery, and broad. *h.* 2ft. Burmah, 1869. Stove. (B. M. 5791.)

C. parviflorum (small-flowered).* *fl.* comparatively small, fragrant; sepals and petals glossy deep brown-purple, the latter narrow and spiral; lip bright yellow, and flattish from above. Stems leafy, 1½ft. to 2ft. high. North America, 1759. This species much resembles *C. pubescens* in habit and flower. Hardy. (B. M. 3024.)

C. Petri (Mr. Peter Veitch's).* *fl.*, sepals white, with green veins; petals light brownish, green at the base, covered on the whole border with long hairs; lip greenish-brown. Malay Archipelago, 1880. Allied to *C. Dayanum.*

C. philippinense (Philippine). A synonym of *C. lævigatum.*

C. pubescens (downy).* *fl.* large; sepals and petals yellowish-brown, marked with darker lines; lip pale yellow and flattened laterally; petals narrow, spirally twisted, exceeding the large showy lip in length. May, June. Stems 1½ft. to 2ft. high, pubescent. North America, 1790. A handsome hardy species, the root of which is employed as a nervous stimulant, in the United States, and is considered equal to Valerian. The fresh plant sometimes causes the same symptoms of irritant poisoning as *Rhus Toxicodendron.* (G. C. n. s., xix. 785.)

C. purpuratum (purple). *fl.* very like those of *C. barbatum*, except that the dorsal sepal has more pure white at the end. Winter. *l.* beautifully spotted. Sumatra, 1836. (B. R. 1991.)

C. Sedeni. *See* **Selenipedium Sedeni.**

C. selligerum (saddle-bearing).* *fl.*, scapes erect, bearing two or three flowers, which are larger than those of either parent; upper sepal white, with broad blackish-crimson veins; inferior sepal smaller and whitish; petals about 3in. long, deflexed with a partial twist, and traversed by crimson veins; lip much like that of *C. barbatum*, but lighter in colour. A very fine hybrid between *C. barbatum* and *C. lævigatum*, but quite distinct from either. See Fig. 596, for which we are indebted to Messrs. Veitch and Sons.

C. spectabile (showy).* *fl.* large, rounder in outline than is usual in the genus, the pure white sepals and petals being broadly ovate and not longer than the lip, whilst the large pouch, which is of a beautiful soft rich rose colour, is very much inflated. June. *l.* bright and light green, profusely furnished with soft white downy hairs. *h.* 1½ft. to 3ft. Northern United States, 1731. It may be grown successfully either in a pot or the open border, thriving well in the shady part of a Rhododendron bed. See Figs. 597 and 598. (Gn., March, 1877.) There are one or two forms.

Cypripedium—*continued.*

C. Spicerianum (Spicer's).* *fl.*, upper sepal white, with a central purple line; lateral sepals greenish, also with a central line; lip greenish-shining; top of the column white, spotted with violet. East Indies, 1879. This handsome stove species comes close to *C. Fairieanum.* (B. M. 6490.)

C. Stonei (Stone's).* *fl.*, sepals large, broad, of a china-white hue, striped and streaked with red and purple, and shaded with ochreous yellow; petals 4in. or 5in. long, narrow, same colour as sepals; lip dull purple, with reddish veins, large, having a very curious pouch, somewhat resembling a Turkish slipper in form; scape usually three-flowered. *l.* about 1ft. in length, obtuse at both ends, dark shining green. Brazil, 1852. A very handsome species. (B. M. 5349.) There are two or three varieties, all worthy of cultivation.

C. superbiens (superb).* *fl.* very large; sepals and petals large, broad, white, beautifully streaked and dotted with rich brown; pouch also very large, prominent, of a uniform rich brown; scape erect, one-flowered. Spring and summer. *l.* oblong, blunt at the apex, beautifully mottled with dark green upon a yellowish-green ground. Java, 1865. Stove. SYN. *C. Veitchianum.* (F. d. S. 1996.)

C. Veitchianum (Veitch's). A synonym of *C. superbiens.*

FIG. 596. FLOWERS AND LEAF OF CYPRIPEDIUM SELLIGERUM.

Cypripedium—*continued.*

C. venustum (handsome).* *fl.* medium size, solitary; sepals and petals greenish-white or pink, striped with bright green, the latter fringed in a somewhat remarkable manner; lip yellowish-green. Winter. *l.* short, dark bluish-green above, curiously mottled and blotched with pale green, whilst the under side is pale purple. Nepaul, 1816. Cool-house species. (B. R. 788.)

FIG. 597. CYPRIPEDIUM SPECTABILE.

C. vernixium (glossy).* A hybrid raised between *C. Argus* and *C. villosum*. *fl.* 4in. or 5in. across solitary, on a stout hairy scape 1ft. high; in shape, they are nearest to *C. villosum*, with the petals longer, narrower, and less deflexed; in colour, they present a remarkable combination of ochraceous brown, crimson, and green, with fainter spots on the petals than in *C. Argus*, and with the glossy varnished surface of *C. villosum*. Of robust habit, the leaves being as large as those of *C. villosum*, with the hieroglyphic markings of *C. Argus*.

C. vexillarium (standard).* A very handsome cross between *C. Fairieanum* and *C. barbatum*, the flowers being exactly intermediate, and combining, in a marked degree, the beauties of both parents. Sepals white, tinged with pale green at the base, and streaked and shaded throughout with soft purple; petals deflected, purple, slightly shaded with green; pouch pale brown, tinged with yellowish-green, and veined with pale green. *l.* pale green, blotched with a darker shade of the same colour. Very rare. (G. C. n. s., xiii. 781, under the name of *C. selligerum*.)

C. villosum (villous).* *fl.* solitary, often measuring 5in. across, and having a fine glossy appearance over their whole surface, which is orange-red, intermixed with light green and dark purple; lip large, protruding, bright light brown. May. *l.* light green, freckled on the lower part with dark spots. *h.* 1ft. India. Stove. (I. H. 1857, 126.)

The following hybrids are as yet very rare in cultivation: *Ainsworthii, Arthurianum, calanthum, calophyllum, chloroneurum, lucidum, marmorophyllum, Meirax, melanophthalmum, patens, politum, porphyrospilum, pycnopterum, superciliare, Swannianum*, and *tessellatum*.

CYRILLA (named after Dominico Cyrillo, M.D., a professor of botany at Naples, and author of "Collectio Plantarum Rariorum Regni Neapol." 1788, "Tabulæ Botanicæ," 1790; he died in 1799). ORD. *Cyrilleæ*. A small genus, containing two or three species (in reality perhaps forms of one) of greenhouse evergreen shrubs, natives of the southern parts of North America, West Indies, and Brazil. They thrive in a compost of sandy loam and peat. Cuttings root readily, placed in sand, under glass, with a small amount of bottom heat.

C. antillana (Antilles). *fl.* white. July. *h.* 6ft. Antilles, 1824.

C. racemiflora (raceme-flowered). *fl.* white, disposed in slender racemose spikes; corolla stellate, small, stiffish. June to August. *l.* obovate-oblong, shortly stalked. *h.* 6ft. Southern United States, 1765.

CYRILLEÆ. A small order of evergreen shrubs or trees, differing from *Ericaceæ* in their free petals and in the anthers opening in slits. Flowers usually racemose. Leaves undivided, exstipulate. The three genera are: *Cliftonia, Costæa*, and *Cyrilla*. There are about eight species, all confined to warmer parts of the New World.

CYRTA. A synonym of **Styrax** (which *see*).

FIG. 598. FLOWER AND LEAF OF CYPRIPEDIUM SPECTABILE.

CYRTANTHERA (from *kyrtos*, curved, and *anthera*, an anther; in reference to the curved anthers). ORD. *Acanthaceæ*. This is now generally looked upon as forming a section of the genus *Jacobinia*. Soft-wooded stove plants. For culture, *see* **Justicia.**

C. aurantiaca (orange). A synonym of *Eloperone aurantiaca.*

C. catalpæfolia (Catalpa-leaved).* *fl.* yellow; thyrse large, compact; bracts and sepals linear-subulate. July. *l.* on longish petioles, broad, cordate, acuminate, entire. *h.* 6ft. Honduras, 1848. (B. M. 4444.)

C. chrysostephana (golden-crowned).* *fl.* bright golden-yellow, disposed in a terminal crown-like corymb. Winter. *l.* ovate-acuminate; midrib and the nerves beneath of a vivid red. Stems obtusely tetragonal. Mexico, 1870. (B. M. 5887.)

CYRTANTHUS (from *kyrtos*, curved, and *anthos*, a flower; the flowers bend down from the summit of the scape). SYN. *Timmia.* ORD. *Amaryllideæ*. A genus of about fifteen species of greenhouse bulbs, natives of the Cape of Good Hope; some of them are not yet in cultivation. Flowers incurved, tubular, clavate, six-cleft; segments ovate-oblong; filaments inserted into the tube, conniving at end. Leaves elongate, narrow, sometimes flexuose. For culture, *see* **Hæmanthus.**

C. angustifolius (narrow-leaved). *fl.* orange, drooping; corolla cylindrical. May and June. *l.* linear, obtuse. *h.* 1ft. 1774. (B. M. 271.)

C. lutescens (yellow). *fl.* pale yellow, four to six, narrow, infundibuliform; filaments very short. February. *l.* narrow, linear, acuminate. 1836. A very interesting species. (B. M. 5374.)

C. Macowani (MacOwan's). *fl.* six to eight in an umbel, on short pedicels; tube and limb bright scarlet, the former slightly curved, about 1in. long, narrowed gradually from the base to the throat, where it is ¼in. thick; segments round-oblong, recurving, imbricating; scape terete, purple, a little overtopping the leaves. *l.* one to three, narrow-linear, 6in. long, ⅛in. broad. (R. G. 960.)

C. M'Kenii (M'Ken's). *fl.* white, sweet-scented. 1868. This closely resembles in structure *C. lutescens*, but is sufficiently distinct for garden purposes. It is described as a semi-aquatic, and is extremely free-flowering. (G. C. n. s., xiv. 766.)

C. obliquus (oblique-leaved). *fl.* numerous, in umbels; corolla yellowish, variegated with orange-red and green, about 3in. long, drooping, tubular, somewhat fleshy and firm; scape 2ft. or more high. May and June. *l.* coriaceous, lorate, obliquely twisted, blunt, distichous. 1774. (B. M. 1133.)

C. sanguineus (blood-coloured). *fl.*, perianth large, infundibuliform, tubular at the base; limb broad, of six oblong, spreading, recurved, mucronate segments, bright orange-red within, yellowish externally, with six red streaks; scape terete, sub-glaucous, hollow, supporting a solitary flower. August. *l.* dark green, scarcely glaucous, radical, lanceolate, tapering into a rounded petiole, slightly keeled at the back and with a depressed line in front. 1860. A very handsome plant. (B. M. 5218.)

C. uniflorus (one-flowered). *fl.* white, with a broad red stripe down the centre of each segment; limb as long as the throat. May to August. *l.* solitary, linear, glaucous. *h.* 6in. 1816. (B. R. 168.)

CYRTANTHUS (of Schreber). A synonym of **Posoqueria** (which *see*).

CYRTOCERAS (from *kyrtos*, curved, and *keras*, a horn; in allusion to the curved horns of the corona segments). SYN. *Centrostemma.* ORD. *Asclepiadeæ*. A stove evergreen twiner, now included under **Hoya** (which *see* for culture).

C. multiflorum (many-flowered). *fl.*, corolla white, tipped with buff, silky inside; segments of corona quite entire on the inner angles; umbels slightly drooping. August. *l.* almost veinless, oval, acute or acuminated, coriaceous, glabrous. Borneo, 1838. SYNS. (of gardens) *C. floribundum, C. Lindleyanum, C. reflexum, Centrostemma multiflorum,* and *Hoya coriacea.*

CYRTOCHILUM (from *kyrtos*, curved or concave, and *cheilos*, a lip; referring to the form of the lip). ORD. *Orchideæ*. This genus of small epiphytal Orchids, now merged by the authors of the "Genera Plantarum" into *Oncidium*, contains many species, of which only one or two are worth growing. For culture, &c., *see* **Brassia.**

C. citrinum (citron-coloured).* *fl.* citron-coloured, in a loose raceme, on a scape 1ft. or more long, arising from the base of the pseudo-bulbs; lip very large, sub-rotund-panduriform. April. *l.* in pairs, linear-oblong, rather acute, sub-coriaceous, about 4in. or 5in. long. Pseudo-bulbs clustered, short, ovate, somewhat compressed, furrowed. Central America, 1848. (B. M. 4454.)

Cyrtochilum—*continued.*

C. maculatum (spotted).* *fl.* green and purple spotted, produced during the winter and spring months, on long spikes. *l.* and pseudo-bulbs dark green. Vera Cruz, 1837.

CYRTODEIRA. Included under **Episcia** (which *see*).

CYRTOMIPHLEBIUM. *See* **Polypodium.**

CYRTOMIUM FALCATUM. *See* **Aspidium falcatum.**

CYRTOPERA. *See* **Cyrtopodium.**

CYRTOPHYLLUM. *See* **Fagræa.**

CYRTOPODIUM (from *kyrtos*, curved, and *pous*, a foot; referring to the form of the labellum or lip). SYNS. *Cyrtopera, Tylochilus.* ORD. *Orchideæ*. A genus of stove epiphytal Orchids, well worth cultivating where plenty of space can be allowed them. Ample pot room is most essential to successful culture. They thrive vigorously in a compost of rich fibrous loam and rotten dung. When growth is completed, and the plant about to flower, a long rest, with little water, should be given, until it recommences to grow in spring, when moisture may be freely applied to the roots, and the temperature increased. Cyrtopodiums require the heat of the East Indian house when in an active condition; at other times, a considerably lower temperature will suffice.

C. Andersoni (Anderson's).* *fl.* produced in fine spikes; sepals and petals about equal, yellow, with a faint tinge of green; lip three-lobed, rich yellow, side lobes large, erect, middle lobe spathulate. Spring. Pseudo-bulbs 5ft. high. Tropical America, 1804. (B. R. 1841, 8.)

C. flavum (yellow). *fl.* large, borne in spikes upwards of 2ft. high; sepals and petals rich yellow; lip nearly emerging out of the sepals, pale yellow, except the darker anterior part, where there are some beautiful brown dots on the anterior of the basilar pouch. *h.* 3ft. East Indies, 1831.

C. punctatum (spotted).* *fl.*, sepals and petals wavy, yellowish, spotted with brown; lip three-lobed, clear yellow, lateral lobes incurved and brownish-red; bracts large, greenish-yellow, with purplish spots; panicle large, many-flowered. April. Brazil. (B. M. 3507.) This is more floriferous than *C. Andersoni*, but not so tall. Even when out of flower, this species and the one just named form two noble plants, with their fine long curved leaves. They are, however, but rarely seen in cultivation.

C. sanguineum (blood-coloured). *fl.* produced on scapes 1ft. to 1½ft. high; sepals and petals varying from pale red-purple to brown; lip pale and rosy. Summer. Root tuberous. Tropical region of Sikkim. (B. M. 6161.)

CYRTOSTACHYS (from *kyrtos*, curved, and *stachys*, a spike; in allusion to the curved spikes of flowers). ORD. *Palmæ*. A genus containing two species of stove palms For culture, *see* **Areca.**

C. Renda (Renda). *fl.* greenish-yellow; spike of inflorescence drooping or pendulous. *l.*, pinnæ linear-ensiform, obtusely and unevenly bidentate, greyish underneath. *h.* 30ft. Malay Archipelago. SYNS. *Areca erythropoda* and *Bentinckia Renda.*

CYSTACANTHUS (from *kystis*, a bladder, and *Acanthus*; referring to the inflated flowers). ORD. *Acanthaceæ*. A stove evergreen perennial, thriving in a light sandy loam and fibry peat. Cuttings of young shoots will root, in spring or summer, if planted in sandy soil, in a hotbed, and covered with a bell glass.

C. turgida (inflated). *fl.* white, reticulated with rosy-pink lines, disposed in thyrsoid panicles; throat yellow. April. *l.* opposite, elliptic-lanceolate, 4in. to 7in. long. *h.* 1ft. to 1½ft. Cochin China, 1869. Plant glabrous. SYN. *Meninia turgida.* (B. M. 6043.)

CYSTANTHE. Included under **Richea** (which *see*).

CYSTIDIANTHUS. A synonym of **Physostelma** (which *see*).

CYSTOPTERIS (from *kystis*, a bladder, and *pteris*, a fern). Bladder Fern. ORD. *Filices*. A genus of elegant and graceful little hardy Ferns, allied to *Microlepis* and *Woodsia*. Involucre membranaceous, sub-orbicular, inserted by its broad base under the sorus, which, at the beginning, it covers like a hood. Sori globose, placed on the back of the veins. For general culture, *see* **Ferns.**

C. alpina (alpine). *sti.* 2in. to 4in. long. *fronds* 4in. to 8in. long, 1in. to 2in. broad, oblong-lanceolate, tripinnatifid; main rachis winged above; largest pinnæ deltoid, lanceolate, 1in. to 1½in. long, about ¼in. broad; pinnules ovate-rhomboidal; segments

Cystopteris—*continued.*

slightly toothed. *sori* small, two to twelve to a pinnule. Mountains of Europe (Teesdale, England) and Asia Minor.

C. bulbifera (bulb-bearing). *sti.* 4in. to 6in. long. *fronds* 6in. to 12in. long, 3in. to 4in. broad at the widest part, ovate-lanceolate, often much elongated upwards, bi- or tripinnatifid; lower pinnules lanceolate, 2in. to 3in. long; segments linear-oblong, very slightly toothed. *sori* two to twelve to a pinnule. North America, 1638. Large fleshy bulblets are formed in the axils of the upper pinnæ, which fall to the ground and become new plants.

C. fragilis (fragile).* *sti.* 2in. to 4in. long. *fronds* 4in. to 8in. long, 1½in. to 2in. broad, ovate-lanceolate, tripinnatifid; largest pinnæ 1in. to 1½in. long, ¼in. to ⅜in. broad; pinnules oblong-rhomboidal; segments bluntly or sharply toothed. *sori* two to twelve to a pinnule. Temperate regions of both Northern and Southern hemispheres. This elegant little species is admirably adapted for growing in fern cases; it has numerous more or less distinct varieties, the best of which are described below. Other forms are: *decurrens*, *interrupta*, *obtusa*, and *sempervirens*.

C. f. angustata (narrow). Whole frond attenuated, and sometimes even depauperated. Rarely exceeding 9in. in height.

C. f. dentata (dentate). *fronds* bipinnate, bluntly toothed. *sori* very close to the margin. *h.* 6in.

C. f. Dickieana (Dickie's). *fronds* 4in. to 5in. in height, rich dark green; pinnæ all bending down somewhat, and overlapping each other; pinnules slightly and bluntly toothed. An elegant form.

C. montana (mountain). *sti.* slender, erect, 6in. to 9in. long. *fronds* about 6in. each way, deltoid, quadripinnatifid; lowest pinnules deltoid-lanceolate, 1in. to 1½in. long, about ¼in. broad; segments cut down to the rachis below; lobes oblong, deeply and sharply toothed. *sori* small, eighteen to twenty-four to the lower segments. *rhiz.* wide creeping. Scotland (very rare), Mountains of Northern hemisphere.

CYTISUS (etymology obscure; according to some, from Cythnus, one of the Cyclades, where some of the species were first found). ORD. *Leguminosæ*. A genus of about thirty-eight species of shrubs (rarely spinous), confined to Europe, Northern Africa, the Canary Islands, and Western Asia. Flowers yellow, purple, or white, not honeyed. Leaves one to three-foliolate, or absent; stipules minute. Two species (*C. canariensis* and *C. racemosus*) are largely grown for greenhouse decoration, in spring; most of the others are either hardy trees, or shrubs, of the easiest possible culture. The latter are readily increased by seed, which are generally produced in abundance; or by layers. Some of the rarer kinds may be grafted on a commoner stock, or on seedling plants of the allied genus, *Laburnum*.

Cultivation of Greenhouse Species. Propagation is effected, in spring, by cuttings of the young wood, which, if taken when about 3in. long (with a heel preferred), inserted under a bell glass, and placed in heat, or in a close frame, will root readily. If gradually hardened, potted, and grown on, small flowering specimens may be obtained the following spring. As soon as the plants have finished flowering, they should be cut back, and kept in a close temperature of about 55deg., in order to induce growth. When started, any repotting required should be seen to, and the plants returned to a similar place, and kept syringed. When established in the new soil, plenty of air should be admitted, and a thin shading applied in summer. The growing season will be completed about August; the plants should then be placed outside until the appearance of frost. Keep quite cool all the winter, and gradually introduce a few specimens to a warmer house, in January, when the flowers will soon open. A succession may be kept up, if plants are available, until June. Turfy loam, with a small proportion of lumpy peat, and some sharp sand added, forms a suitable compost; and the plants, when opening their flowers, are much benefited by doses of liquid manure. *C. racemosus* forms nice little specimens, in 5in. or 6in. pots, for room decoration, where they keep good a long time. They may afterwards be grown on to form plants 3ft. high and nearly as much through. *C. canariensis* requires similar treatment, but does not grow quite so freely. It is very useful for flowering later in the season than the other species noticed.

C. Adami. *See* **Laburnum Adami.**

Cytisus—*continued.*

C. albus (white). *fl.* white, in fascicles, disposed in long racemes. May. *l.* simple and trifoliate, sessile; leaflets linear-oblong, silky. Branches terete, twiggy. *h.* 6ft. to 10ft. Spain and Portugal, 1752. Hardy.

C. alpinus. *See* **Laburnum alpinum.**

C. Ardoini (Ardoino's). *fl.* yellow, one to six in the axils of each leaf, usually secund; calyx campanulate, scarious in upper half, hairy; lips divergent; pedicels about twice the length of the calyx, without bracteolæ, hairy. Spring. *l.* trifoliolate; leaflets obovate, hairy, small, silky when young. Stems rod-like, generally decumbent, many springing from a knotted and twisted stock. *h.* 4in. Mountains of the Maritime Alps, 1867. An extremely pretty species, somewhat resembling *Genista*. (Fl. Ment. 58.)

C. austriacus (Austrian). *fl.* yellow, terminal, somewhat umbellate. June. *l.*, leaflets lanceolate, attenuated at both ends. Branches twiggy, terete, and, as well as the leaves, clothed with adpressed strigose pubescence. *h.* 2ft. to 4ft. East Europe, 1741. Hardy.

C. biflorus (two-flowered). *fl.* yellow, oblong, about 1½in. long, longer than the leaves, parallelly paired; peduncles short, very thick; calyx pale green, membranous, villous, twice shorter than the vexillum, tubularly oblong, slightly swollen and compressed, shallowly bilabiate; lips straight, contracted. May. *l.* ternate, about 1in. long, silkily furred underneath; leaflets elliptically-oblong, rather pointed, nearly of the same length as the petiole, with a small mucro; petiole silkily furred. Branches smooth, silkily furred, loosely and sparsely-leaved. *h.* 3ft. Hungary, 1760. Hardy deciduous. (B. R. 308.)

FIG. 599. FLOWERING BRANCH OF CYTISUS SCOPARIUS.

Cytisus—*continued.*

C. canariensis (Canary Islands).* *fl.* yellow, in elongated, many-flowered, secund racemes; bracts and bracteoles setaceous. June to August. *l.* shortly-stalked, trifoliate; leaflets obovate-oblong, acute. Canary Islands. A much-branched dwarf shrub, everywhere softly villose.

C. capitatus (headed). *fl.* yellow, numerous, capitate at the tops of the branches (sometimes lateral in the autumn). June. *l.*, leaflets ovate-elliptic, villous. Branches straight, hispid. *h.* 2ft. to 4ft. Europe, 1774. Hardy. (L. B. C. 497.)

C. filipes (thread-stemmed). *fl.* white. March. Branches slender, pendulous. Teneriffe, 1838. A very elegant conservatory plant.

C. hirsutus (hairy).* *fl.* yellow, lateral, on very short pedicels, aggregate. June. *l.*, leaflets obovate, villous beneath. Branches twiggy, terete; young ones hispid; adult ones smooth. Europe, 1739. Hardy decumbent species. (Fl. Ment. 28.)

C. Laburnum. *See* **Laburnum vulgare.**

C. nigricans (blackish). *fl.* yellow; racemes elongated, terminal, erect. June. *l.* trifoliolate, stalked, clothed with adpressed pubescence beneath, as well as the branches, calyces and legumes; leaflets elliptic. Branches terete, twiggy. *h.* 3ft. to 6ft. Europe, 1730. Hardy. (B. R. 802.)

C. proliferus (proliferous). *fl.* white, lateral, umbellately aggregate. April and May. *l.*, leaflets elliptic, and, as well as the calyces, silky. Branches terete, velvety. *h.* 2ft. to 4ft. Teneriffe, 1779. Greenhouse. (B. R. 121.)

C. purpureus (purple).* *fl.* purple, axillary, solitary, on short pedicels. May. *l.*, leaflets oblong. Stems procumbent, twiggy. Plant glabrous. European Alps, 1792. Hardy. This is a very beautiful shrub when in flower, but has a better effect when grafted on a rather tall Laburnum. (B. M. 1176.)

C. racemosus (racemose).* *fl.* bright yellow, disposed in a terminal spike 6in. long. July. *l.* trifoliate. *h.* 3ft. Said to have come from the Peak of Teneriffe, 1835; probably, however, a plant of garden origin. Greenhouse evergreen. *C. Everestianus* (R. H. 1873, 390), a garden form, with flowers a couple of shades deeper in colour, is similar to this in habit, &c.

C. scoparius. Common Broom. *fl.* yellow, axillary, pedicellate, solitary. April to July. *l.*, trifoliate, petiolate; upper ones simple, and, as well as the leaflets, oblong. Branches angular. *h.* 3ft. to 10ft. Europe (Britain). Hardy. See Fig. 599. There are three or more forms of this species.

C. sessilifolius (sessile-leaved). *fl.* yellow; racemes terminal, erect, short; calyces each having a three-leaved bract just under it. May. *l.*, leaflets three, ovate; floral leaves almost sessile. Branches terete. *h.* 4ft. to 6ft. Plant quite smooth. South Europe, 1629. (B. M. 601.)

C. Weldeni (Welden's). A synonym of *Petteria ramentacea.*

CZACKIA. A synonym of **Paradisia** (which *see*).

DABŒCIA (called St. Dabeoc's Heath in Ireland). ORD. *Ericaceæ.* A very pretty shrub, having much the habit of a species of Heath, and adapted for decorating the front of shrubberies, or for growing on rockwork or banks. It thrives in a sandy peat soil, with a little loam added. Increased by layers, in autumn; or by cuttings, placed under a handlight.

D. polifolia (Polium-leaved).* St. Dabeoc's Heath. *fl.* white, rose, or purple, very elegant, drooping from the short pedicels in a loose terminal raceme; corolla ovoid, ventricose, shortly four-lobed; lobes broad, recurved, imbricated. June to September. *l.* small, the lower ones ovate, the upper ones narrow, all green above, and very white beneath. Branches ascending, clothed with short, rather viscid hairs. *h.* 1ft. to 2ft. Common on the heathy wastes of South-western Europe, Mayo and Connemara in Ireland, and the Azores. SYN. *Menziesia polifolia.*

DACRYDIUM (from *dakrudion*, a diminutive of *dakru*, a tear; referring to the resinous exudations). ORD. *Coniferæ.* Very ornamental trees, somewhat resembling the Spruce in appearance, but with slightly pendulous branches. Male catkin ovoid, girded by imbricating bracts at base; stamens numerous, imbricate. A mixture of sandy loam and peat suits them. Propagated by cuttings, made when ripe, and placed in sand, under a glass. Generally speaking, none of the species are suited to our climate; but *D. cupressinum* and *D. Franklinii* have, under exceptional circumstances, proved successful.

D. cupressinum (Cypress-like).* *l.* pale green, small, closely-imbricated all round. Branches weeping. *h.* 60ft. to 100ft. (in England, 16ft.). New Zealand, 1825. A pyramidal tree.

Dacrydium—*continued.*

D. elatum (tall). *l.* crowded, without order, erectly spreading, mucronate. *h.* 60ft. Palo Penang, 1830. A large timber tree, of slow growth.

D. excelsum (lofty). *l.* loosely imbricate, subulate, compressedly tetragonal, mucronate, glaucous, with depressed angles. *h.* 200ft. New Caledonia.

D. Franklinii (Franklin's). *l.* scale-like, imbricated. Branches short, horizontal; branchlets numerous, slender, pendulous. *h.* 100ft. Tasmania, 1844. Timber with an aromatic fragrance.

D. Mai (Mai). *l.* linear-obtuse, with a callous point; margins revolute, green above, glaucous beneath. *h.* 80ft. Tasmania, 1844.

D. taxoides (Yew-like). *l.* alternate, closely placed, falcate, obtuse at the ends, attenuated and twisted at the base, ¼in. to ⅜in. long, and one-and-a-quarter lines broad; midribs on the upper and under surfaces prominent. Branches sub-verticillate, having a purplish tint when young. New Caledonia. A conical shrub.

DACTYLICAPNOS THALICTRIFOLIA. *See* **Dicentra thalictrifolia.**

DACTYLIS (from *daktulis*, a finger's breadth; apparently in allusion to the size of the clusters). ORD. *Gramineæ.* This genus is closely allied to *Festuca*, from which it differs in that the spikelets are densely crowded in thick, one-sided clusters, arranged in an irregular short spike or slightly-branched panicle. The only species is that described below; it is one of the best and strongest-growing kinds of our native grasses, and is well adapted for sowing alone on marshy land.

D. glomerata (glomerate). Cock's-foot Grass. *fl.*, spikelets several-flowered, crowded in one-sided clusters, forming a dense, branching panicle; glumes and lower palet herbaceous, keeled, awn-pointed, rough, ciliate on the keel, the five nerves of the latter converging into the awn-like point; the upper glume commonly smaller and thinner. June. *l.* flaccid, but rough on the edges. *h.* 1ft. to 2ft. In meadows, pastures, woods, and waste ground throughout Europe, Central and Russian Asia (except the extreme north); abundant in Britain. Perennial. (Sy. En. B. 1788.) *D. g. variegata* (variegated) is a very pretty form of this, and is extensively employed for bedding purposes.

DACTYLOCTENIUM (from *daktylos*, a finger, and *ktenion*, a little comb; alluding to the digitate and pectinate spikes). ORD. *Gramineæ.* A genus of several species, for the most part natives of Africa. Spikelets several-flowered, with the uppermost flower imperfect, crowded on one side of a flattened rachis, forming dense pectinate spikes two to five in number, digitate at the summit of the culm; glumes compressed, keeled, and sub-herbaceous, the exterior one cupsidate. The species are mostly annuals, little known to cultivation.

DACTYLOSTYLES. *See* **Zygostates.**

DADDY LONG LEGS. *See* **Crane Fly.**

DÆMIA (its Arabic name). ORD. *Asclepiadeæ.* A genus comprising six species of stove evergreen twiners, natives of tropical Asia and Africa. Flowers umbellate; corolla sub-rotate, with a short tube; corona double, the outer one an annular five or ten-lobed membrane. Leaves opposite, cordate. They thrive in a compost of fibry peat and loam, with a small quantity of sand added. Cuttings of firm side shoots will root in sandy soil, if placed under a glass, in bottom heat.

D. extensa (extended). *fl.*, margins of corolla ciliated; peduncles and pedicels elongated, filiform. July. *l.* roundish-cordate, acuminated, acute, auricled at the base, downy. East Indies, 1777. SYN. *Raphistemma ciliatum.* (B. M. 5704.)

DÆMONOROPS (derivation doubtful, probably from *dæmon*, a deity, and *ops*, appearance; alluding to the beauty of the plant). ORD. *Palmæ.* Very elegant stove palms, now included, by Bentham and Hooker, under *Calamus*, but differing from that genus chiefly in having its flowers scattered along the spikes, and also in the spathes entirely encircling the young spikes. For culture, *see* **Calamus.**

D. melanochætes (black-bristled). *l.* pinnate; pinnæ long, narrow, and pendent; petioles sheathing at the base, where they are armed with very long sharp spines, with brown tips and much swollen bases. *h.* 150ft. Malay Archipelago. An ornamental plant, of a very dark green colour.

Dæmonorops—*continued.*

D. ornatus (adorned). A very pretty species, having finely-cut pinnate leaves. At present, it is very rare. Java, 1875.

D. palembanicus (Palembang). *l.* pinnate, broadly ovate; pinnæ numerous, narrow, elongated; petioles erect, armed at the back with somewhat stout deflexed spines, which are thickened at the base; young leaves of a bright cinnamon brown. Sumatra, 1872.

D. periacanthus (ring-spined). *l.* broadly ovate, pinnate; petioles furnished with numerous spines, which are set on in irregular rings; young leaves nearly straw-coloured. *h.* 15ft. Sumatra, 1872. This species resembles *D. palembanicus.*

D. plumosus (plumed).* *l.* of a rich dark green, remarkably plume-like, pinnate, 2ft. to 4ft. or more in length; pinnæ 1ft. long, less than 1in. wide, tapering to a narrow point, pendent; petioles densely armed with stout black spines, which are white at the base. India, 1870. A very elegant species.

DAFFODIL. *See* **Narcissus.**

DAHLIA (named after Dr. Dahl, a Swedish botanist, and pupil of Linnæus). SYN. *Georgina.* ORD. *Compositæ.* A popular genus of herbaceous plants, having a double involucre, no pappus, and a large scarious bracteole at the base of each floret. There are but a small number of species, and all are natives of Mexico and Central America.

The Dahlia was first introduced into this country from Spain, in 1789, by the Marchioness of Bute. This importation, and another made by Lady Holland, in 1804, were, however, lost to cultivation. A third stock was afterwards brought from France, about the year 1815, and from this the numerous forms have been obtained. It is most probable that nearly all the types and varieties of the common garden Dahlia now in cultivation have originated from *D. coccinea* (see Fig. 602), *D. Mercki* (see Fig. 605), and *D. variabilis* (see Fig. 606). Being among the best of outside autumn-flowering plants, and, moreover, easily propagated and grown, Dahlias form indispensable subjects for flower-garden decoration, suitable for those of either large or small dimensions.

There are four important classes into which Dahlias may be divided, in addition to a few minor ones, containing only a limited number of representatives. These are known as Show, Fancy, Bouquet or Pompone, and Single-flowered. *D. Juarezii* represents a small class, with semi-double flowers, distinct from any of the others. *D. excelsa* and *D. imperialis* reach a great height before flowering, and are best grown in pots for greenhouse decoration in autumn and winter. Show Dahlias are all double, and require to have large flowers of the most perfect form to be considered good. Selfs and pale-coloured flowers, edged or tipped with a darker colour, are included under Show varieties. Flowers of a similar size, but having florets dark-coloured at the base, and tipped or striped with a paler colour or white, are known as Fancy varieties. The Bouquet or Pompone, also those sometimes termed the Bedding section, have double flowers of a much smaller size; various colours are included, and all are invariably very pretty; the habit is dwarf and compact, constituting these the best for bedding purposes, and the flowers are most useful for cutting, when Double ones are required. The Single-flowered varieties have again become very popular, and are amongst the most beautiful and useful subjects for cut flowers. The form and size of flower-heads in all the sections have now attained a high degree of excellence. White, yellow, red, and purple, with a great variety between of these colours intermixed, are also represented in each of the large classes.

PROPAGATION. Dahlias are propagated by seeds, cuttings, division of the roots, and sometimes by grafting.

Seeds. These are produced by the Single varieties in large quantities, but not so freely by the Doubles. Obtaining seeds from the latter is mostly restricted to florists who make this plant a speciality, and who do it with a view to raising new varieties. The colours of the Single flowers are reproduced by this method

Dahlia—*continued.*

tolerably true to character, and only those that are good should be selected from which to save seed. Sow thinly in pans, at the end of March, and place on a hotbed or in a propagating house. The seedlings will soon appear, and should then be placed singly in pots, and grown on for a time in the same temperature. Repot as becomes requisite, and gradually harden off in a cool frame, ready for putting outside at the end of May. If liberally treated, large plants and good flowers may be obtained the first season.

Cuttings. This is the method of propagation usually adopted, and is easily accomplished in spring. The roots having been stored and kept dry in winter, should be introduced to bottom heat at the beginning of February, and these, but not the crowns, should be covered with soil. A slight syringing daily will be sufficient to induce the production of shoots, and each of these may be removed, if required, as soon as it has two joints. If placed singly in small pots of light leaf soil and sand, and plunged in a close frame, roots will soon be emitted, and the plants may be hardened, repotted, and transferred to cooler positions, as recommended for seedlings. Cuttings of Dahlias root best when taken in this way quite young; and, as a succession soon appears, any variety may be readily increased. The tops of the young shoots also strike freely in summer.

Division of Roots. All Dahlias have several fleshy

FIG. 600. DAHLIA, FLESHY ROOTSTOCK.

tuber-like roots (see Fig. 600) that may be separated singly for propagating after they are started in spring, allowing

FIG. 601. DAHLIA ROOTS, divided for Propagating.

one shoot to each (see Fig. 601). If these are inserted in large pots, vigorous plants may be obtained for placing outside later on; but the quantity will be limited to the number of tubers when divided, and will not generally be so many in the end as might have been procured from cuttings.

Grafting is occasionally practised for preserving new varieties throughout the winter, when otherwise there would be a danger of losing them. The plan is to take a shoot with two joints, cut it below the bottom one, and remove a portion of the skin on one side. A fleshy root from a hardier sort should be prepared, by having a similar-sized hole or incision made for the reception of the graft. This should be tied in, and the matting covered over with clay, the whole being afterwards potted and placed under a hand glass until a union has taken place. To keep the scion alive in winter, it must be kept growing slowly, and cuttings from it may be obtained in spring. This system of propagation is not often resorted to.

CULTIVATION. Being vigorous-growing plants, Dahlias require a rich, moderately heavy soil to give the best results; but their cultivation will often prove successful under conditions widely varied in this respect. When it

Dahlia—*continued.*

is proposed to plant in masses, the ground should be trenched, and manure added if the soil is naturally poor. It is not advisable to apply strong manure in spring, as over-luxuriance in foliage would thereby be encouraged at the expense of the production of flowers. A light, open

FIG. 602. FLOWERING SHOOT OF DAHLIA COCCINEA.

position, free from the shade of trees, is best; but surrounding shrubs or dwarf plants are often an advantage to Dahlias by protecting them from high winds. Mixed flower borders, backed up with shrubs, are good positions, and a fine effect may be produced in autumn, especially with the best of the Single varieties, by planting in masses, such as large circular beds. The Dwarf Pompone section is best adapted for use in smaller beds, and these, or others, may be kept still lower by pegging down when young. Planting out should not be attempted before the beginning of June, in most localities, as the

FIG. 603. FLOWER-HEAD OF DAHLIA IMPERIALIS.

least exposure to frost causes much injury. The heights of the different varieties must be ascertained, and their

Dahlia—*continued.*

respective positions fixed accordingly. From 3ft. to 6ft. apart is none too much space for strong, tall-growing varieties. Seedlings, or late-struck cuttings, will not require quite so much. Water well after planting, and apply a temporary stake to each, for a time. Dahlias are much benefited by frequent applications of water during summer, and by liquid manure after the buds are formed. If exhibition blossoms are required, the shoots and flower buds must be thinned out in the younger stages of growth; but otherwise it will be unnecessary to do so. Permanent stakes of about 4ft. in height, must replace the others when the plants are established and growing. The most useful Dahlias to cultivate for cut flowers are the Single and Pompone sections; and the most distinct and highly-coloured sorts should be selected.

Storing. Dahlias may remain in the ground until the tops are destroyed by frost, when they should be cut down to within 6in. of the ground, and afterwards lifted.

FIG. 604. FLOWER-HEAD AND LEAF OF DAHLIA JUAREZII.

Remove as much soil as possible with a pointed stick, attach the label of each to the stem, and store away in a dry, cool, frost-proof place. Looking over occasionally to remove any part of the roots that may be damping, is all that is required until starting again the following spring. Young plants, raised either from seeds or cuttings, will supply large roots in the autumn of the same season.

INSECTS. Earwigs are most destructive to Dahlias, by eating out the young points of the shoots, and afterwards the florets, before they are developed. Small flower-pots, half-filled with dry moss, and inverted on the tops of the stakes, or hollowed bean stalks placed amongst the branches, are the best-known traps. They should be examined each morning, and any Earwigs found therein destroyed.

A list of the species, and the most striking of what may be called the "botanical" varieties, is given below.

D. bidentifolia (bidentate-leaved). A synonym of *D. coccinea.*

D. coccinea (scarlet). *fl.-heads* with scarlet ray-florets and yellow disk; outer involucral bracts five, reflexed; inner series numerous. Autumn. *l.* pinnate, scabrous. *h.* 3ft. to 4ft. SYNS. *D. bidentifolia* and *Georgina Cervantesii.* See Fig. 602. (B. M. 762.)

D. crocata (yellow). A synonym of *D. variabilis.*

D. excelsa (tall). *fl.-heads* pale lilac-purple, 4in. across. *l.* doubly pinnatipartite, 2½ft. long by about 2ft. broad. Stem perennial, very thick, becoming woody, growing to the height of

Dahlia—*continued.*

20ft. and upwards, less branched, and assuming more the aspect of a tree than any other species. (B. 88.)

D. glabrata (smooth). A synonym of *D. Mercki.*

FIG. 605. FLOWERS AND LEAF OF DAHLIA MERCKI.

D. gracilis (slender). *fl.-heads* brilliant orange-scarlet; involucral bracts small, narrow. Summer and autumn. *l.* bipinnate, glabrous; leaflets ovate, coarsely crenate. *h.* 4ft. to 5ft. (R. G. 861.)

D. imperialis (imperial).* *fl.-heads* white, tinged with lilac, and streaked with blood-red at the base, drooping, bell-shaped; disposed in large spreading panicles, 3ft. to 5ft. across. *h.* 10ft. to 12ft. Mexico, 1863. This remarkable and beautiful species, from its not flowering till late in the autumn, does not fully perfect itself out of doors, and should, consequently, be removed to the greenhouse or conservatory early in October. See Fig. 603. (B. M. 5183.)

D. Juarezii (Juarez's).* Cactus Dahlia. *fl.-heads* brilliant scarlet; florets overlapping each other, and varying in length, thus giving the flower an irregular appearance. *h.* 3ft. A form which originated under cultivation in Mexico. Very distinct and remarkable; well worth the most extensive cultivation. See Fig. 604.

Dahlia—*continued.*

D. Mercki (Merck's). *fl.-heads* white and yellow, or lilac and yellow, small, with a good outline. October. *h.* 2ft. to 4ft. 1839. SYN. *D. glabrata.* See Fig. 605, for which we are indebted to Mr. T. S. Ware. (B. M. 3878.)

D. M. Decaisneana (Decaisne's). *fl.-heads* purple, with a golden disk, small, numerous. *l.* pinnate, divided. *h.* 3ft. (R. H. 1864, 31.)

D. superflua (superfluous). A synonym of *D. variabilis.*

D. variabilis (variable). *fl.-heads* very variable. August and September. 1789. This is probably the first species introduced, and whence by far the majority of forms now very common, have originated. See Fig. 606. In the wild state, the central, or disk florets are said to be yellow, small, and tubular, and the marginal, or ray florets, only conspicuous and highly coloured in some shade of scarlet. SYNS. *D. crocata, D. superflua.*

D. viridiflora (green-flowered). *fl.-heads* pure self-green, Pompone size, double, and full-petalled. A curious monstrosity, of garden origin.

FIG. 606. FLOWERING BRANCH OF A DOUBLE VARIETY OF DAHLIA VARIABILIS.

VARIETIES. Subjoined is a large selection of the best garden Dahlias cultivated at the present time, including many of the new ones distributed in 1884. As good varieties are numerous, and additional improved forms in some way obtained annually in each section, it is more than likely that others of equal merit have been omitted. The varieties with single flowers being now so numerous, a classification has been arranged and adopted by Mr. T. S. Ware, of Tottenham, who makes these plants a speciality (and to whom we are indebted for Figs. 607 to 611), for grouping them into four sub-divisions or classes, according to the shape of the flowers. Fig. 607 represents two varieties of the section with Stellate or Star-like flowers; these are rather small, but very floriferous, and of a dwarf bushy habit. Another form is shown in Fig. 608, where the flowers are Flat. Fig. 609 shows those with beautifully Reflexed flowers, that are invariably solid and massive, and well adapted for exhibition. The fourth, and last, group is represented in Figs. 610 and 611, where the flowers are only Slightly Reflexed; these come between the Flat and the Much Reflexed sections, and include some fine varieties for exhibition. The figures are only intended

Dahlia—*continued.*

to represent the classification of the flowers according to their shape, and do not refer to the colours, as a great diversity of these is included in each group. Many are self-coloured; others, which are edged, blotched or striped, are termed Fancy varieties of the Single-flowered class.

Show Varieties. ACME OF PERFECTION, primrose-yellow; ALEXANDER CRAMOND, maroon, shaded crimson, good; ARBITRATOR, delicate fawn; AURORA, golden-buff, distinct; BESSIE, lilac, **full**; BURGUNDY, dark puce, suffused light purple, good; CARDINAL, rich scarlet, full, of fine form; CHARLES LIDGARD, deep yellow, edged crimson; CHARLES TURNER, yellow, edged and tipped crimson; CHARLOTTE DORLING, large white, tipped; CONDOR, peculiar colour, buff, shaded orange; COUNTESS OF LONSDALE, rosy-lilac; CREAM OF THE VALLEY, cream, tinged salmon, fine form; CRITERION, bright rose, good; CROWN PRINCE, pale buff, full; DAUNTLESS, dark orange, shaded; DELIGHT, creamy-white, edged purple; DEWDROP, deep primrose; DUKE OF ALBANY, rich crimson, fine form; EDWARD PURCHASE, bright crimson; ETHEL BRITTEN, blush-white, edged purple; FLAG OF TRUCE, white, tipped lilac; FRANK RAWLINGS, purplish-magenta, fine flower; GEORGE RAWLINGS, **dark maroon, finely cupped**; GOLDFINDER, yellow, tipped red; GRAND NATIONAL, yellow, very fine, new; HERBERT TURNER, white, tinged lilac; HOPE, bright rosy-lilac, large; H. W. WARD, yellow, heavily edged with crimson; IMPERIAL, deep purple, shaded lilac, fine form; JAMES COCKER, large, purple, very fine; JAMES VICK, purplish-maroon; JOHN COCKER, glossy black; JOHN NEVILLE KEYNES, fine yellow; JOHN WYATT, deep scarlet; JULIA WYATT, creamy-white, large and good; LEAH, golden-yellow; LILLIE WARD, white, tinged pale rose; MAJOR CORNWALLIS WEST, scarlet, shaded orange; MRS. GLADSTONE, delicate soft pink, new and very fine; MRS. HARRIS, white, edged pale lilac, good; MRS. HENSHAW, white, large and full; MRS. P. WYNDHAM, yellow, edged rosy-purple; MRS. W. HASKINS, fawn, distinct and good, new; MURIEL, fine clear yellow, new; OVID, rich purple, extra good; ROSETTA, large purple; RUBY GEM, ruby-crimson, small yellow tip, new; SHIRLEY HIBBERD, dark crimson; STATESMAN, purplish-crimson, new; SUNBEAM, bright clear buff, good form; THOMAS GOODWIN, dark maroon; WALTER H. WILLIAMS, bright scarlet, large and fine; WILLIAM RAWLINGS, rich crimson-purple.

FIG. 607. SINGLE DAHLIAS (1) MAGPIE AND (2) FREEDOM—VARIETIES ILLUSTRATING STELLATE FLOWERS.

Fancy Varieties. ALDERMAN, lilac, striped and spotted purple,

Dahlia—*continued.*

new; ANNIE RAWLINGS, pure white, striped lake; ARABELLA, buff, scarlet and crimson stripes, new; BARNABY RUDGE, fawn, spotted crimson; BEAUTY, yellow, tipped rose; CHARLES WYATT, rose, flaked crimson; CHORISTER, fawn, striped crimson and rose; DRAGON, yellow, striped bright crimson; DUCHESS OF ALBANY, pale orange, rich crimson stripes, new; FANNY STURT, red, tipped white; FLORA WYATT, orange, flaked red; FREDERICK SMITH, lilac, striped purple; GEORGE BARNES, pale lilac, striped crimson; HENRY GLASSCOCK, buff, striped crimson; HERCULES, yellow, striped crimson; HUGH AUSTIN, orange-scarlet, striped dark red; JAMES O'BRIEN, yellow, crimson and rose stripes; JESSIE

Dahlia—*continued.*

MAB, red, tipped and edged white; R. DEAN, yellow, flaked crimson; REBECCA, lilac, striped crimson, new; REGULARITY, blush-white, striped crimson; REV. J. B. M. CAMM, yellow, flaked red, large; ROBERT BURNS, lilac, flaked dark crimson; SAM BARTLETT, blush, striped crimson; WILLIAM ADY, lilac, striped purple, fine; WIZARD, fawn, striped maroon, tipped white.

Bedding and Bouquet or Pompone Varieties. CAMELLIÆFLORA, pure white, rather large; COMTE VON STERNBERG, yellow, tipped white, small; CRIMSON BEAUTY, maroon-crimson; CUPID, white, suffused with rose; DORA, primrose and white,

FIG. 608. SINGLE DAHLIAS (1) DR. MOFFAT AND (2) DANGER—VARIETIES ILLUSTRATING FLAT FLOWERS.

MCINTOSH, red, distinct white tips; JOHN FORBES, fawn-colour, striped maroon, fine; JOHN LAMONT, maroon, striped black; LADY ANTROBUS, red, pure white tips; LOTTY ECKFORD, white, striped purple, fine form, new; LUCY FAWCETT, pale yellow, spotted crimson; MADAME SOUBEYRE, rosy-lilac, striped carmine; MANDARIN, yellow, mottled crimson; MISS L. LARGE, puce, striped and spotted with crimson; MONARCH, deep crimson, tipped white; MRS. SAUNDERS, yellow, tipped white, extra fine; ORACLE, deep yellow, striped crimson; PEACOCK, dark maroon, tipped white, large; PROFESSOR FAWCETT, dark lilac, striped chocolate; QUEEN

good habit; DOVE, white, tipped rosy-lilac, pretty; E. F. JUNGKER, amber, compact flower; FAIR ELLEN, white, shaded purple; FLORA MACDONALD, pale primrose; GEM, rich scarlet; GEORGE THOMPSON, pure yellow, free; GERMAN FAVOURITE, crimson-lake, deep edge; GOLDEN NUGGET, bright golden-yellow; HEBE, blush, edged rose; JOHN SANDY, buff, tipped red; LADY BLANCHE, pure white, small, fine for cutting; LEAH, yellow, good; LITTLE ARTHUR, bright orange-scarlet; LITTLE BEAUTY, lilac, tipped white; LITTLE DEAR, blush white, tipped rose; LITTLE WONDER, scarlet; MDLLE. VALENTINE FACONET, white

Dahlia—*continued.*

and purple, striped; NEMESIS, maroon, tipped white; NORTHERN LIGHT, scarlet, showy; PRINCE OF LILIPUTIANS, deep maroon, very fine; PURE LOVE, pale lilac, extra good; THE PET, dark maroon, white tip; TITANIA, small yellow, free, and good for cutting; TRIUMPH, scarlet; WHITE ASTER, white, free and good.

Single Varieties, including a selection from all the various-shaped flowers. ARGUS, deep magenta, shaded rose; B. BARKWAY, deep scarlet, broadly edged orange, new; BEACON, fiery-crimson, very fine (see Fig. 610, 1); BEAUTY OF CAMBRIDGE, fiery-crimson, fine flower; BEDDING GEM, orange-scarlet, dwarf, very floriferous, new; BRIDAL WREATH, creamy-white; CETYWAYO, rich blackish-maroon, new; CHERRY, bright cherry, shaded rose; CHRISTINE, pale silvery-pink, good; DANGER, glowing scarlet, small flower (see Fig. 608, 2); DARKNESS, intense dark mulberry, distinct; DR. MOFFAT, dark maroon, margined crimson, new (see Fig. 608, 1); FRANCIS FELL, bright rosy-purple; FREEDOM, scarlet-lake, new and fine (see Fig. 607, 2);

Dahlia—*continued.*

GEORGE CLARK, deep crimson, edged pale purple, extra fine (see Fig. 611); HARLEQUIN, deep rose, centre band of purple in each petal; H. W. PETITT, bright purplish-rose, edged lilac; IMOGENE, primrose, shaded lilac; LUCY IRELAND, rich magenta, suffused crimson, very fine (see Fig. 609, 2); LUTEA GRANDIFLORA, rich yellow, large and free; MAGPIE, cerise, tipped white, new and distinct, good (see Fig. 607, 1); MAUVE QUEEN, rich mauve, fine large flower; MILLIE GIBBS, white, edged pale yellow, new; MRS. BOWMAN, purple-magenta extra fine, new; MRS. CASTLE, intense lake, a full circular flower, new; MRS. GOLDRING, rich rosy-pink, large flower; NEGRESS, dark maroon, almost black, distinct foliage; NELLIE WARE, purplish-crimson, good form, new; PARAGON, deep maroon, good old variety; SCARLET DEFIANCE, rich scarlet, fine flower; TERRA-COTTA, distinct colour, like terra-cotta; THALIA, rich amaranth, dwarf; T. S. WARE, orange-scarlet, large circular flower, new; UTILITY, orange, suffused scarlet (see Fig. 610, 2); VICTOR STRANDBERG, rich scarlet, dark centre, new; WHITE PET, small flower, white, suffused pale rose, fine for cutting

FIG. 609. SINGLE DAHLIAS (1) WHITE PET AND (2) LUCY IRELAND—VARIETIES ILLUSTRATING FLOWERS MUCH REFLEXED.

Dahlia—*continued.*

(see Fig. 609, 1); WHITE QUEEN, white, tinged rose, very free; WHITE STAR, white, slightly shaded rose, fine form; WILLIAM CULLINGFORD, rich yellow.

Cactus and Semi-Cactus Varieties, of which *D. Juarezii* is the type. ANNIE HARVEY, scarlet-crimson, small flowers, very effective, new; COCHINEAL, rich crimson, very fine for cutting, new; CONSTANCE, pure white, free-flowering, most useful; FIRE KING (Glare of the Garden), dazzling scarlet, very floriferous; PARROT, intense orange-scarlet, small, good for cut flowers.

Dais—*continued.*

D. cotinifolia (Cotinus-leaved). *fl.* pinkish, in umbellate involucrated heads. June. *l.* obovate, obtuse. *h.* 10ft. Cape of Good Hope, 1776. The bark of this yields the strongest fibre known to the natives of Southern Africa.

DAISY. *See* **Bellis.**

DALBERGIA (named after Nicholas Dalberg, a Swedish botanist, born 1730, died 1820). ORD. *Legumi-*

FIG. 610. SINGLE DAHLIAS (1) BEACON AND (2) UTILITY—VARIETIES ILLUSTRATING FLOWERS SLIGHTLY REFLEXED.

DAIS (from *dais*, a torch; in allusion to the form of the inflorescence). ORD. *Thymelœaceæ*. A genus containing four species of trees and shrubs, three natives of Madagascar, and one from the Cape of Good Hope. The only one in cultivation is *D. cotinifolia*, an interesting greenhouse deciduous shrub. It thrives in a mixture of peat and loam. Increased by cuttings, made of half-ripened shoots, or of the roots, in April, placed in sand, under a bell glass, in heat.

nosœ. A genus containing above sixty species of stove evergreen trees or climbing shrubs, natives of tropical regions in Asia, Africa, and America (two are Australian). Flowers violaceous-purple, or white, in dichotomous cymes or in irregular sub-cymose panicles, axillary or terminal. Leaves alternate, impari-pinnate (rarely unifoliolate). They grow freely in a mixture of fibry peat and turfy loam, to which may be added a small portion of sand. Cuttings of firm young shoots will root in March, if placed in sand,

Dalbergia—*continued.*

under a glass, and in a little bottom heat. Two of the most important are here described.

D. latifolia (broad-leaved). Black Wood. *fl.* white; panicles terminal. May. *fr.* lanceolate. *l.* pinnate; leaflets roundish, emarginate. *h.* 30ft. East Indies. A large deciduous tree, the wood of which is extremely hard, and of a dark colour. It is extensively employed for furniture, carving and fancy work, as well as for gun carriages, &c. (B. F. S. 24.)

D. Sissoo. Sissoo-tree. *fl.* white; panicles axillary, puberulous, shorter than the leaves. May. *l.*, leaflets five, alternate, petiolate, obovate, abruptly acuminated, glabrous above, but pubescent beneath. *h.* 30ft. Bengal, 1820. The wood of this species is very durable, and is largely used in Bengal in the manufacture of gun carriages, railway sleepers, &c. (B. F. S. 25.)

Dalea—*continued.*

D. mutabilis (changeable). *fl.* at first white, but ultimately changing to violet; spikes cylindrical, at length becoming much elongated, pedunculate. October. *l.* with five to ten pairs of obovate or obcordate leaflets. *h.* 1½ft. Mexico, 1818. Plant erect, branched. Perennial. SYN. *D. bicolor.* (B. M. 2486.)

D. Mutisii (Mutis's). *fl.* deep blue, disposed in dense cylindrical heads, which are about 1½in. long. July. *l.* with eight to ten pairs of elliptic-oblong, obtuse leaflets. *h.* 2½ft. to 3ft. South America, 1828. An elegant greenhouse perennial. SYN. *Psoralea Mutisii.*

DALECHAMPIA (named in honour of James Dalechamp, 1513-1588, a French physician, botanist, and philologist). Including *Rhopalostylis* (of Klotzsch). ORD. *Euphorbiaceæ.* There are above sixty species in this genus, but very few of which are of any horticultural merit. The one described below (perhaps the only one in cultivation) is attractive on account of the brilliant rich carmine-rose colour of the bracts. It thrives well in a stove, and requires perfect drainage, and a mixture of loam, peat, and leaf mould, in equal parts, to which may be added a good portion of silver sand. Propagated by cuttings.

D. Roezliana (Roezl's).* *fl.* very fragrant; peduncles slender, thread-like, angular, 2in. to 3in. long, bearing at the top two small ovate bracts, placed at the base of two large, broadly egg-shaped, acuminate, denticulate, rosy-pink floral leaves; within these two are other smaller bracts, placed around and among the male and female flowers, some of them thick and club-shaped, and bearing at the top a fringe of short, yellow, waxy-looking

FIG. 611. SINGLE DAHLIA GEORGE CLARK, OR PARAGON IMPROVED—VARIETY ILLUSTRATING FLOWERS SLIGHTLY REFLEXED.

DALEA (named after Dr. Samuel Dale, an English botanist of the last century, and author of a book on Materia Medica). ORD. *Leguminosæ.* A genus of greenhouse herbs, sometimes suffruticose at the base, often beset with glandular dots. Leaves impari-pinnate, having the terminal leaflet sessile. Flowers purplish-blue, whitish, or rarely yellow, disposed in pedunculate spikes, which are opposite the leaves. More than a hundred species are known. The headquarters of the genus is Mexico, a few only being found in Chili and the Andes. For culture, *see* **Psoralea.**

D. alopecuroides (Alopecurus-like). *fl.* whitish, in dense cylindrical silky-villous spikes. Summer. *l.* of many linear-oblong leaflets. *h.* 1ft. to 2ft. United States. Annual.

D. bicolor (two-coloured). A synonym of *D. mutabilis.*

Dalechampia—*continued.*

threads, which give a singular appearance to its blossoms. *l.* 5in. to 9in. long, 1in. to 3in. wide at the broadest portion, very shortly stalked, sub-cordate, tapering towards the base, acuminate at the apex. Vera Cruz, 1867. Habit erect, branched, leafy. This species differs from the majority of its congeners in being erect, not climbing, and in its undivided leaves. (B. M. 5640.) There is a variety (*alba*) with white bracts.

DALIBARDA (named after Denis Dalibard, a French botanist). ORD. *Rosaceæ*. Low perennials, with creeping and densely-tufted stems or rootstocks. The species described below is a very pretty slow-growing little alpine or rock-plant, thriving in deep, peaty soil, in a rather sheltered position. Propagated by divisions.

D. cordata (cordate). A synonym of *D. repens.*

D. fragarioides (Strawberry-like). A synonym of *Waldsteinia fragarioides.*

D. repens (creeping). *fl.* white, on scape-like peduncles. May and June. *l.* cordate, obtuse, crenated, pubescent. Stems creeping. North America, 1768. SYNS. *D. cordata* and *D. violæoides.*

D. violæoides (Viola-like). A synonym of *D. repens.*

DALMATIAN CAP. *See* **Tulipa.**

DALRYMPLEA. A synonym of **Turpinia** (which *see*).

DAMASK ROSE. *See* **Rosa damascena.**

DAMASK VIOLET. *See* **Hesperis matronalis.**

DAME'S ROCKET. *See* **Hesperis matronalis.**

DAME'S VIOLET. *See* **Hesperis matronalis.**

DAMMARA (its native name in Amboyna). Dammar Pine. ORD. *Coniferæ*. A genus of large handsome conifers. Leaves petiolate or almost sessile, sub-opposite and coriaceous. Cones ovate or globular, and axillary; scales persistent, bractless. The proper name of this genus is now *Agathis*, that name having been given by Salisbury long before Lambert published that of *Dammara*. There are about ten species hitherto described; they are natives of the Malayan Archipelago, Fiji, New Caledonia, New Zealand, and Eastern tropical Australia. All the species require a greenhouse temperature. Cuttings of ripe, firm shoots, inserted in sand, in spring, will root, in a gentle bottom heat.

D. australis (Southern). Kauri Pine. *l.* linear-oblong, rarely elliptic, flat on both sides, from 1½in. to 2½in. long, and ½in. to ¾in. broad at the widest part, thick, coriaceous, of a greenish-brown colour. Branches large, spreading, numerous, distant, smooth, divided into numerous smaller ones. *h.* 120ft. to 150ft. New Zealand, 1821.

D. obtusa (blunt-leaved). *l.* variable in shape, mostly oblong, rounded at the ends, 3¼in. to 4in. long, 1½in. broad, thick, leathery, dark glossy green. *h.* 150ft. New Hebrides, 1851. The timber of this tree is extensively employed in shipbuilding.

D. orientalis (Eastern). Amboyna Pine. *l.* opposite, ovate-oblong, entire, glabrous, of a thick, coriaceous texture, from 2in. to 4in. long, and nearly 1½in. broad at the widest part, straight, rarely falcate, smooth, dull green on both surfaces. Branches vertical, slightly reflexed, ascending at the extremities; branchlets spreading. *h.* 100ft. Moluccas, 1804. A large tree, yielding the transparent resin called Dammar. (B. M. 5359.) There is a variety named *alba*, differing from the species in having much longer and more lanceolate leaves, with the edges more regularly rolled up on the under side, slightly undulated, whitish; the bark, also, is of a much whiter colour.

DAMMAR PINE. *See* **Dammara.**

DAMNACANTHUS (from *damnao*, to conquer, and *acanthos*, a spine; in reference to the strong opposite spines). ORD. *Rubiaceæ*. A genus containing two or three species of greenhouse shrubs, with branching habit. They thrive in rich sandy loam and peat. Propagated by cuttings, inserted in sand, under a bell glass, in bottom heat.

D. major (greater). *fl.* white, sweet-scented, axillary and solitary, or twin; calyx five-cleft; corolla funnel-shaped. *fr.*, drupe red, one to four-seeded. *l.* small, opposite, coriaceous, sub-sessile, acuminate; stipules interpetiolar, tricuspidate. Spines acicular. Japan, 1868.

D. m. submitis (nearly unarmed). *fl.* white. Spines very small. Japan, 1868.

DAMPIERA (named in honour of Captain William Dampier, R.N., the celebrated circumnavigator, who paid great attention to natural history in all his voyages).

Dampiera—*continued.*

ORD. *Goodenovieæ*. Greenhouse suffruticose herbs or shrubs. Flowers axillary or terminal, sub-spicate or solitary; corolla bilabiate. They grow freely in a mixture of turfy loam, turfy peat, and sand. Cuttings strike readily, planted in the same kind of soil, with a hand glass placed over them. There are upwards of thirty species, all from Australia, very few of which are in cultivation in this country.

D. Brownii (Brown's). *fl.* blue; corollas densely clothed with black plumose hairs; peduncles solitary or clustered in the upper axils. July. *l.* petiolate, oval, nearly entire, flat, scabrous above. *h.* 1ft. to 2ft. 1824. Plant suffruticose, erect, clothed with scurfy tomentum. SYN. *D. ovalifolia.*

D. ovalifolia (oval-leaved). A synonym of *D. Brownii.*

DAMPING. This is practised in all plant houses in summer, and in tropical houses at all times. It is absolutely necessary in these instances, and in most others where much fire heat is employed, to preserve sufficient moisture in the atmosphere for the well-being of the plants. The floor and walls of the majority of glass structures, especially forcing houses, may be frequently damped in spring and summer. Plants of tender growth bear much more heat with less ventilation when this is well attended to; undue evaporation from the leaves being also prevented. As healthy and free growth is materially affected by Damping, it becomes a matter of great importance towards good cultivation. It is not advisable to throw water over hot pipes; and, although its application frequently beneath or around plants may prove beneficial in dry weather in summer, it may be destructive in many cases to wet the foliage each time, especially when the sun is shining.

DAMPING OFF. This term is applied to the premature decay of the leaves, flowers, or stems of plants. Its effects are most marked on young and tender seedlings, when crowded together, or placed under unsuitable atmospheric conditions. Sometimes the cause may be traced to an excess of moisture that may be suspended in the air or applied to the roots. Damping off amongst cuttings is often caused by allowing them to become dry, and then suddenly applying too much water. The water is generally blamed when the actual cause is drought, and the sudden change subsequently caused by the water. A temperature in a glass house or propagating frame lower than that outside, in either case will cause Damping by the condensation of water on all parts of the plants, as they become colder, like the house. Raise the temperature and the moisture becomes suspended. Immediately Damping is detected amongst tender seedlings, they should be separated and placed out singly in fresh soil. This will invariably check it, but the operation is best performed before Damping begins. Other causes, some unknown, affect different plants, and bring about their destruction in this way; but the primary ones are those here indicated.

DAMSON. *See* remarks under **Plum.**

DANAA. A synonym of **Physospermum** (which *see*).

DANÆA (named after Pierre Martin Dana, a writer on the plants of Piedmont). ORD. *Filices*. A remarkable and distinct genus of stove ferns, not very extensively cultivated. Rhizomes woody. Fronds pinnate, rarely simple, fleshy, coriaceous; pinnæ usually articulated. Sori linear, occupying the whole length of the veins, and crowded so as to cover the whole under surface of the divisions of the fertile fronds. For general culture, *see* **Ferns.**

D. alata (winged). *sti.* of barren fronds 2in. to 6in. long. *barren fronds* 1ft. to 1½ft. long, 6in. to 8in. broad, with eight to ten pinnæ on each side; central ones short-stalked, 3in. to 5in. long, ¾in. broad, the apex acuminate, serrated, the base rounded. *fertile fronds* on a longer stipe, the pinnæ stalked more distinctly, 1in. to 3in. long, acute or obtuse. West Indies.

Among the twelve species described by Baker, the following are given as possible inhabitants of our stoves: *elliptica*, *Moritziana*, and *nodosa.*

DANCING GIRLS. *See* **Mantisia Saltatoria.**

DANDELION (*Taraxacum officinale*). The culture of this herb as a salad-plant is the same as described for **Chicory** (which *see*). The flowers must be picked off frequently in summer, to prevent the ripening, and distribution by the wind, of seed. Dandelion roots are sometimes dried, roasted, and ground, and employed to adulterate coffee, or as a substitute for it. The leaves, when blanched, are used in this country, and more so on the Continent, as a salad. See Fig. 612.

FIG. 612. DANDELION (TARAXACUM OFFICINALE).

DANES' BLOOD. *See* **Sambucus Ebulus.**

DANEWEED. *See* **Sambucus Ebulus.**

DANEWORT. *See* **Sambucus Ebulus.**

DAPHNE (from *Daphne*, the Greek name of the Bay-tree, *Laurus nobilis*, used by Theophrastus). ORD. *Thymelaceæ*. Very ornamental evergreen or deciduous shrubs (rarely tall). Flowers odorous, honeyed; perianth tubular, with four spreading lobes and a naked throat; stamens eight, sub-sessile in two series. Fruit coriaceous or fleshy. Leaves usually alternate. There are about forty species, the geographical distribution of the genus being Europe, North Africa, and Temperate Asia. A popular genus of plants, extensively cultivated both in greenhouses and in the open; their fragrant flowers and dwarf-growing habit rendering them excellent subjects for pot culture. The less hardy sorts are good conservatory plants, succeeding admirably when trained on walls, inside, in a partially shaded position. The red and white forms of *D. indica* are grown most largely indoors.

Cultivation. The species cultivated for conservatory decoration are often grafted on stocks of one of the hardier kinds, as, being naturally of slow growth, good plants may be obtained much quicker this way than by cuttings. For propagating by the latter method, matured shoots, or side growths, should be selected in autumn, inserted thinly in well-drained pots of peaty soil, and covered with a bell glass. If kept in a cool house in winter, they will callus, and may, early in spring, be introduced to gentle heat, to encourage growth and the emission of roots. The young plants may then be potted singly, and grown on in a close, but not high, temperature, and afterwards hardened and kept quite cool during the following autumn and winter, in order to thoroughly ripen the wood, a material point towards success in flowering *D. indica*. A temperature of 55deg. will be sufficient to excite growth, and this must not be exceeded until the plants are required to blossom. Grafted specimens may be treated in a somewhat similar way, repotting annually after flowering is over, using loam and peat in equal proportions as a compost. *D. indica* seldom grows fast, consequently pots of 5in. or 6in. diameter will be sufficiently large for good-sized plants. Drainage must always be insured, and water applied very carefully, especially in winter.

Daphne—*continued.*

The hardier species may be used outside, in sheltered positions, on rockwork, or in shrubbery borders, with good effect. *D. Laureola* and *D. pontica* are fine evergreen species, thriving well when planted beneath the shade of trees. The cultivation does not materially differ in the younger stages from the greenhouse kinds; but as these make large specimens in a much shorter time, a richer, though well-drained, soil should be given when planting out.

D. alpina (alpine). *fl.* white, very fragrant, sessile, aggregate. May to July. *l.* lanceolate, a little obtuse, tomentose beneath, deciduous. *h.* 2ft. European Alps, 1759. A low, hardy, branchy evergreen shrub. (L. B. C. 66.)

D. altaica (Altaic). *fl.* white, scentless, sessile, in terminal umbels of about five flowers. April. *l.* obovate-lanceolate, glabrous, of a somewhat glaucous and yellowish-green, especially when young. *h.* 1ft. to 3ft. Siberia, 1796. Hardy. (B. M. 1875.)

D. Blagayana (Blagay's).* *fl.* white, tubular, fragrant, disposed in dense terminal heads. April. *l.* alternate, lanceolate, glabrous. *h.* 1ft. Mountains of Eastern Europe, 1872. Hardy evergreen. (G. C. n. s., xvii. 505.)

FIG. 613. DAPHNE CNEORUM, showing Habit and Detached Cluster of Flowers.

D. Cneorum.* Garland Flower. *fl.* bright pink, sweet-scented, terminal, aggregate, sessile. April, and again in September. *l.* lanceolate, glabrous, mucronate. *h.* 1ft. Europe, 1752. A hardy evergreen trailing shrub. See Fig. 613. There are two or three forms of this species.

D. collina (hill). *fl.* pinkish, in terminal groups; calyx externally silkily villous. January to June. *l.* obovate, glabrous and glossy above, and hirsutely villous beneath. *h.* 2ft. to 3ft. South of Italy, 1752. Erect hardy evergreen. (B. M. 428.)

D. c. neapolitana (Neapolitan). A very pretty plant, with fragrant flowers, which are produced during the winter. It differs from the type chiefly in the want of pubescence on the under surface of the leaves. (L. B. C. 719.)

D. Fortunei (Fortune's). *fl.* lilac, lateral, appearing before the leaves. February. *l.* oblong, or ovate-oblong, silky. *h.* 3ft China, 1844. A hardy deciduous species. (F. d. S. 208.)

D. Genkwa (Genkwa). *fl.* lilac, fragrant, rather large, fascicled, appearing before the leaves. April. *l.* opposite, lanceolate. *h.* 2ft. to 3ft. Japan, 1866. Hardy evergreen. (R. G. 499.)

D. Gnidium (Gnidium). *fl.* pink, fragrant, in terminal panicled racemes. June to August. *l.* linear-lanceolate, with a cuspidate tip. *h.* 2ft. South-west Europe, 1797. Hardy evergreen. (S. F. G. 356.)

D. indica (Indian).* *fl.* red or white, terminal, sessile. June. *l.* acute, entire. *h.* 4ft. China, 1800. Greenhouse evergreen.

D. japonica (Japanese). *fl.* pinkish-purple, terminal, corymbose. February. *l.* oblong-lanceolate, wavy, margined with yellow. *h.* 2ft. Japan, 1840. Greenhouse evergreen. (P. M. B. 8, 175.)

D. Laureola (Laurel).* Spurge or Wood Laurel. *fl.* yellowish-green, in axillary, simple, drooping clusters shorter than the leaves. January to March. *l.* obovate-lanceolate, thick, glossy, shining. *h.* 3ft. to 4ft. Europe (Britain). A low, bushy, ever-

Daphne—*continued.*

green shrub. The berry of this species is very poisonous. See Fig. 614. (Sy. En. B. 1247.)

FIG. 614. DAPHNE LAUREOLA, showing position of Flowers and Leaves.

D. Mezereum (Mezereum).* Common Mezereon; Spurge Flax; Spurge Olive. *fl.* red, distributed over the branches mostly in threes, and in pairs and fours, expanding before the leaves appear. February, March, or April. *l.* lanceolate, membranous, 2in. to 3in. long, obtuse or acute, shortly petiolate. *h.* 3ft. to 4ft. Europe (England, but very rare, perhaps not indigenous). A slender, straggling, deciduous shrub. The bark of this species is very acrid, and is used medicinally, for which purpose it is largely imported from Germany. There are white, red, and autumnal-flowering varieties.

D. odora (sweet-scented).* *fl.* purple, fragrant; heads terminal, sessile, many-flowered. March. *l.* scattered, oblong-lanceolate, smooth. *h.* 3ft. China, 1771. Greenhouse evergreen. (B. M. 1587.)

D. o. Mazeli (Mazel's).* *fl.* white, pink, sweet-scented, borne on short lateral branchlets all along the branches, and thus differing from all the other varieties of *D. odora*. It produces its flowers from November until spring, and succeeds best in a partially shaded position. (Gn., Nov. 1878.)

D. oleoides (Olive-like). *fl.* white, terminal, sessile, a few together, and surrounded by leaves that in some measure involucrate them. April. *l.* obovate-lanceolate, terminated with a minute mucro, glabrous on both sides, glossy. *h.* 2ft. South-east Europe, 1818. A hardy evergreen shrub. (B. M. 1917.)

D. pontica (Pontic).* *fl.* greenish-yellow, fragrant, bractless, glabrous, in many-flowered upright clusters, each of the long partial stalks of which bears two flowers. April and May. *l.* obovate-lanceolate, glabrous. *h.* 4ft. to 5ft. Eastern Europe, &c., 1759. A hardy, spreading, branchy, evergreen shrub. (B. M. 1282.) There is a form with variegated leaves, but it is rare.

D. striata (streaked). *fl.* rosy-purple, Carnation-scented, terminal, aggregate. June and July. *l.* sub-spathulate-linear, sessile. *h.* 2ft. Europe, 1819. A hardy evergreen, forming dense, twiggy, spreading masses, 1ft. to 3ft. across.

D. Tarton-raira. *See* **Thymelæa Tartonraira.**

DAREA. A section of *Asplenium.*

DARLINGTONIA (named in honour of Dr. Darlington, an American botanist). ORD. *Sarraceniaceæ.* A very curious and remarkable hardy herbaceous monotypic genus, allied to *Sarracenia*, but without the curious umbrella-shaped summit to the style, which is so conspicuous in the latter. It is an admirable plant for growing in the greenhouse, in conjunction with Cephalotus, Drosera, Sarracenia, &c., and requires the same cultural treatment. Out of doors, it thrives best in a damp and shady position, in the rockery or fernery, where it must be kept well supplied with water. The best soil is one composed of peat and chopped sphagnum, to which plenty of sharp sand and small pieces of limestone are added. Darlingtonias should have the protection of a handlight, which is preferable to a bell glass, as ventilation may be more easily given. It is usually considered somewhat difficult to get the seeds to germinate and grow. The following mode of treatment has, however, been found successful: The pots should be filled, within 1in. of the top, with fibrous peat, charcoal, fresh-chopped

Darlingtonia—*continued.*

sphagnum, and sand, in equal parts, then coated with fresh tips of sphagnum. On this the seeds should be sprinkled, and well watered, the pots being stood in pans of water, and covered with a bell glass, in order to keep the atmosphere above the seeds in a moist condition. The pots should then be placed in a shady position in a cool greenhouse, and in about five or six weeks the seeds will commence germinating. When strong enough, the seedlings should be pricked off into pans filled with the same compost as above mentioned, and transferred to a cold, shady frame, where they must be kept constantly moist. Perfect drainage and a cool, shady position, are at all times absolutely essential.

FIG. 615. DARLINGTONIA CALIFORNICA.

D. californica (Californian).* *fl.* about 2in. in diameter; sepals whitish or pale green; petals yellow-green, marked with dark red-brown veins, oblong. April. *l.*, or pitchers, slender at the base, gradually swelling upwards; apex bent over, or hood-like, with a large triangular process depending from the aperture; ground colour bright green, upper portion and throat beautifully mottled with white, and reticulated with reddish-pink veins. *h.* 1ft. to 1½ft. California, 1861. See Fig. 615. (B. M. 5920.)

DARNEL. *See* **Lolium temulentum.**

DART MOTH. *See* **Turnip Moth.**

DARWINIA (named in honour of Dr. Darwin, author of a once famous poem entitled "The Botanic Garden"). SYNS. *Genetyllis, Hedaroma*, and *Polyzone.* ORD. *Myrtaceæ.* A genus of greenhouse, Heath-like, evergreen shrubs; there are upwards of a score species known, all natives of Australia. Flowers red or white, in terminal fascicles, inclosed in large, coloured, ovate or oblong involucres, and interspersed with chaffy bracts. Leaves scattered, full of pellucid dots. For culture, &c., *see* **Calythrix.**

D. citriodora (Lemon-scented). *fl.* usually four, in small terminal heads; involucre scarcely exceeding the flowers, consisting usually of four outer leaf-like bracts, and four inner ovate ones, more or less coloured. *l.* nearly opposite, from narrow-oblong to almost ovate-lanceolate, obtuse. *h.* 1ft. to 2ft. SYN. *Hedaroma latifolium.*

D. diosmoides (Diosma-like). *fl.* white, numerous, in compact terminal globular heads; calyx about one and a half lines long, the adnate part obscurely five-ribbed, and covered nearly from the base by glandular papillæ more or less distinctly arranged in six to eight prominent parallel rings; petals white. April. *l.* scattered, crowded, linear, semi-terete or triquetrous, thick or slender, obtuse. *h.* 3ft. 1827. An erect bushy shrub. SYN. *Genetyllis diosmoides.*

D. fascicularis (fascicled). *fl.* red, about six or twelve together, in terminal heads, within the last leaves; calyx slender, the adnate part prominently five-ribbed, otherwise smooth; lobes very small and scale-like; petals broad. June. *l.* scattered, often crowded, linear, slender, semi-terete, or obtusely triquetrous, shortly petiolate; floral ones slightly longer. *h.* 3ft. to 6ft. 1820. An erect much-branched shrub.

D. fimbriata (fimbriated).* *fl.* rather numerous; involucres ovoid, about ⅜in. long, or rather more, the inner bracts petaloid, pink, broadly oblong or almost cuneate and very obtuse; the outer ones short, broad, and squarrose, but coloured, and all

Darwinia—*continued.*

ciliate; petals triangular. June. *l.* scattered, often crowded, oblong-elliptical, very obtuse; margins recurved, strongly ciliate-denticulate. *h.* 1ft. to 2ft. 1864. A bushy shrub. SYN. *Genetyllis fimbriata.* (B. M. 5468.)

D. Hookeriana (Hooker's).* This species much resembles *D. macrostegia*, but is usually smaller, more slender, and less twiggy. SYN. *Genetyllis Hookeriana.* (B. M. 4860, under the name of *Genetyllis macrostegia.*)

Darwinia—*continued.*

them, but not coloured; calyx rather slender, strongly five-ribbed, otherwise smooth; petals rather narrow, concave, with a deep-coloured spot at the top. May. *l.* mostly opposite, linear or lanceolate, obtuse; margins revolute. *h.* 1ft. SYN. *Hedaroma thymoides.*

DASYLIRION (from *dasys*, thick, and *lirion*, a lily). ORD. *Liliaceæ.* Very ornamental greenhouse evergreens,

FIG. 616. FLOWERING BRANCH OF DARWINIA MACROSTEGIA.

D. macrostegia (large-involucred).* Tulip-bearing Myrtle. *fl.* rather numerous; involucre campanulate, nearly 1½in. long; the petal-like inner bracts broadly obovate, pale yellow, streaked with red, entire; petals white. June. *l.* scattered, elliptic-oblong or slightly cuneate, obtuse, ½in. to ¾in. long; margins recurved, entire. *h.* 2ft. to 3ft. 1854. SYNS. *Genetyllis tulipifera* (B. M. 4858), *G. macrostegia, Hedaroma tulipiferum.* See Fig. 616.

D. pinifolia (Pine-leaved). This species closely resembles *D. fascicularis* in habit, foliage, and inflorescence, but with a different calyx and staminodia. SYN. *Hedaroma pinifolium.*

D. purpurea (purple). *fl.* numerous, in dense, hemispherical heads; involucral bracts numerous, more or less coloured, imbricate, but somewhat spreading, rather longer than the flowers; calyx about two lines long, the adnate part five-ribbed at the base, the upper half encircled by five or six rings of glandular papillæ. *l.* scattered, crowded, and almost imbricate, linear, obtuse. Erect, much-branched shrub. SYNS. *Genetyllis purpurea, Polyzone purpurea.*

D. taxifolia (Yew-leaved). *fl.* white, at the ends of the branchlets; calyx prominently five-ribbed, the adnate part slightly rugose between the ribs; lobes small, scale-like; petals ovate. June. *l.* mostly opposite, linear-falcate, triquetrous or laterally compressed, acute, ¼in. to ½in. long, almost petiolate. *h.* 1ft. to 3ft. 1824. A straggling or decumbent shrub.

D. thymoides (Thyme-like). *fl.* sessile, four to eight together, in terminal heads, the outer bracts sometimes slightly exceeding

allied to *Nolina.* Flowers dicœcious, in dense panicles; flower-stems sometimes 10ft. or 12ft. in height. Leaves crowded, linear, gracefully drooping. They thrive in a compost of two parts loam, one peat, and one sand. Perfect drainage and a plentiful supply of water during the summer months, are important cultural items. Increased by seed. Dasylirions form admirable plants for sub-tropical gardening, or for conservatory and indoor decoration.

D. acrotrichum (hair-tipped).* *fl.* white; panicle dense, cylindrical, 4ft. to 5ft. long. *l.* densely rosulate, recurved, linear, 2ft. to 3ft. long, less than 1in. broad, with a long fibrous tuft at apex; marginal spines sharp, yellowish. Trunk stout, simple. *h.* 6ft. to 10ft. Mexico, 1851. SYN. *D. gracile.* (B. M. 5030.)

D. a. brevifolium (short-leaved). *l.* shorter than those of the type, rarely more than 2ft. in length, not becoming pendulous.

D. glaucophyllum (milky-green-leaved).* *fl.* white; panicles narrow, 3ft. to 4ft. long; peduncles elongated; flower-stem 10ft. to 12ft. high. *l.* dense, 2ft. to 3ft. long, about ¾in. broad, glaucous; margin armed with small teeth. *h.* 12ft. Mexico, 1846. SYN. *D. glaucum.* (B. M. 5041.) The variety *latifolium* has broader leaves, and is more robust in growth than the type.

D. glaucum (grey). A synonym of *D. glaucophyllum.*

Dasylirion—*continued.*

D. gracile (graceful). A synonym of *D. acrotrichum.*

D. graminifolium (grass-leaved). *fl.* white; inflorescence 8ft. to 9ft. long; panicle narrow. *l.* in a dense rosette, linear, 3ft. to 4ft. long, six to seven lines broad, green; marginal prickles half to one line long. Trunk short. *h.* 8ft. Mexico, 1835.

D. Hartwegianum (Hartweg's). A synonym of *D. Hookeri.*

D. Hookeri (Hooker's). *fl.* purplish; inflorescence about 1½ft. long; peduncles short; panicle dense. *l.* narrow, linear, 1½ft. to 2ft. long, two to three lines broad, pale glaucous green; margin serrate. Caudex a gigantic tuber, with the leaves springing in fascicles from tubercles on its surface. *h.* 3ft. Mexico, 1846. SYN. *D. Hartwegianum.* (B. M. 5099.)

D. laxiflorum (loose-flowered). A synonym of *D. serratifolium.*

D. serratifolium (saw-leaved). *fl.* white; panicle dense, 1ft. long. *l.* 2ft. long, nearly 1in. broad; marginal teeth half to one-and-a-half lines long. Stem stout. Mexico. SYN. *D. laxiflorum.*

DATE PALM. *See* **Phœnix dactylifera.**

DATE PLUM. *See* **Diospyros Kaki.**

DATISCA (derivation unknown). ORD. *Datisceæ.* A very graceful herbaceous perennial, well suited for a collection of hardy, fine-leaved plants, and also as an isolated specimen. It thrives in a deep, good soil, and may be propagated by dividing plants that have become well established; also by seeds.

FIG. 617. FLOWERS AND LEAF OF DATISCA CANNABINA.

D. cannabina (Hemp-like).* *fl.* yellow, disposed in long, loose, axillary racemes. September. *l.* pinnate, alternate; leaflets in three pairs and an odd one, about 2in. long, and ½in. broad, deeply serrate. *h.* 3ft. to 6ft. Crete and Western Asia, 1739. The male and female forms should be grown, as, though both are graceful, the fertilised female plant is the most so, and continues much longer in a green state. See Fig. 617. (S. F. G. 960.)

The only other species of the genus is *D. glomerata,* a native of California and Mexico; it is probably not in cultivation in this country.

DATISCEÆ. A small order of dicotyledonous plants, closely allied to the Begonias. Herbs or trees, glabrous, pubescent, or almost scaly. Flowers diœcious, regular, rarely hermaphrodite or polygamous; corolla small or altogether wanting; calyx tube adhering to the ovary. Fruit a one-seeded capsule, opening at the top. Leaves alternate, simple or pinnate. There are only three known genera: *Datisca, Octomeles,* and *Tetrameles.*

DATURA (derivation obscure; said to come from the Arabic name, *datora*). ORD. *Solanaceæ.* Including *Brugmansia, Ceratocaulis, Dutra,* and *Stramonium.* Ornamental and pretty annuals, shrubs or trees. Flowers extra-axillary, pedunculate, or from the forks of the branches; corolla funnel-shaped. The annual species are generally known as *Daturas,* and the shrubby ones as *Brugmansias.* From an horticultural point of view, the latter section is by far the most important.

PROPAGATION. This may be easily effected by cuttings of about 6in. in length, placed in sandy soil, and plunged in a bottom heat of 60deg. Young shoots, heeled off the old

Datura—*continued.*

wood, when they have grown about 6in. long, in spring, root freely. The annual species may be readily raised from seed.

CULTIVATION. *Shrubby Species.* These thrive well against pillars, or planted in beds or borders in conservatories, and allowed to grow into large bushes or dwarf trees. The plants bear severe pruning remarkably well, and may be cut to keep them in any form or size desired. The best time to prune is at the close of the flowering season, or later in the autumn. This section of the genus is naturally an evergreen one, but does well treated as deciduous. Daturas enjoy a moderate amount of warmth when in full growth, but require to be kept dry and quite cool in winter. The best way of growing them in moderate-sized houses is in 12in. pots, as standards. These may have stems ranging in height from 4ft. to 7ft. The head should be formed of three or more branches, which will quickly be produced on stopping the main stem. After it is once obtained, the annual growths may be cut back to where the leading branches originate. Old plants flower far more freely than younger ones. Standard plants of *D. sanguinea* and *D. suaveolens* are well suited as permanent features for centres of beds or groups. *D. Knightii* does well in sheltered positions outside, in summer, and forms a rich and pleasing addition to the usual sub-tropical large-leaved plants. During the flowering period, manure water is most useful in increasing the vigour of the plants and the number and size of the flowers. Daturas are rather subject to White Scale on the leaves and stems.

Annual Species. These are of very easy cultivation. Seeds may be readily raised in a hotbed; and the seedlings, when large enough to handle, should be placed singly in small pots, and finally transferred to their flowering quarters in the open border. They delight in a light sandy soil, and require plenty of space for full development.

FIG. 618. FLOWERING BRANCH OF DATURA CERATOCAULA.

Datura—*continued.*

D. arborea (tree-like).* *fl.*, corolla white, 7in. to 8in. long. August. *l.* elliptic-oblong, quite entire, and are, as well as the petioles and branches, clothed with powdery pubescence. *h.* 7ft. to 10ft. Peru, &c., 1813. Greenhouse shrub. SYN. *Brugmansia candida.*

D. ceratocaula (horn-stalked). *fl.*, corolla with a green tube, white limb, tinged with purple, sweet-scented. July. *l.* ovate-lanceolate, toothed, hoary beneath. Stem terete, purplish, dichotomous, horn-formed, pilose at the base. *h.* 2ft. to 3ft. Cuba, 1805. Annual. SYN. *Ceratocaulos daturoides.* See Fig. 618. (B. M. 3352.)

D. chlorantha flore-pleno (double yellow-flowered).* *fl.* yellow, double, sweet-scented, solitary, axillary, pendent, shortly pedunculate; corolla funnel-shaped, dilated at the mouth. August to October. *l.* agreeing in shape with *D. cornigera*, but quite glabrous. Branches terete. Native country unknown. 1845. A handsome, free-flowering species. (B. M. 5218.)

D. cornigera (horn-bearing). *fl.*, corolla white, or cream-coloured, large, funnel-shaped, striated, the mouth spreading, five-lobed, the lobes terminated by a long subulate, spreading or recurved point; peduncles axillary, single-flowered, curved downward, so that the flower is drooping. Summer. *l.* chiefly confined to the extremities of the branches, ovate, petiolate, acuminate, entire, or sinuate or angled. Stem shrubby, about 3ft. high; the young branches and almost every part of the plant clothed with soft down. *h.* 10ft. Organ Mountains, 1844. A very singular plant. (B. M. 4252.)

D. fastuosa (prickly).* *fl.*, corolla violaceous outside, and white inside, oblique. July. *l.* ovate, acuminated, repandly-toothed, unequal at the base, and are, as well as the stem, downy. *h.* 2ft. to 3ft. East Indies, &c., 1629. Annual.

D. lævis (smooth). A synonym of *D. muricata.*

D. Metel (Metel).* *fl.* fragrant; corolla white, large. June. *l.* cordate, quite entire, or a little toothed, and are, as well as the stem, downy. *h.* 2ft. Tropics, 1596. Annual. (B. M. 1440.)

FIG. 619. FLOWERING BRANCH OF DATURA METELOIDES.

D. meteloides (Metel-like)* is a greenhouse evergreen, very similar to the foregoing, with large longer-tubed flowers, of a bluish-violet, or else white. California, 1856. SYN. *D. Wrightii.* See Fig. 619. (F. d. S. 1266.)

D. muricata (muricated). *fl.*, corolla white, long. July. *fr.* muricated with strong short prickles, slightly erect. *l.* ovate, repand, when young toothed, glabrous, unequal at the base. *h.* 2ft. to 3ft. Tropical Asia, 1820. Annual. SYN. *D. lævis.*

D. quercifolia (Oak-leaved). *fl.*, corolla violaceous. July. *l.* sinuately pinnatifid, hairy on the veins beneath. *h.* 1ft. to 2ft. Mexico, 1824. Annual.

D. sanguinea (bloody).* *fl.* solitary, pendulous, issuing from the forks of the branches; corolla funnel-shaped, 7in. long, pubescent; tube orange-yellow, green towards the base, thick and fleshy; calyx large, ventricose, five-angled, five-ribbed, with prominent veins, copiously pubescent. Summer. *l.* alternate, often geminate, ovate-oblong, obtuse, waved and sinuated, with short blunt lobes, copiously clothed on both sides with soft white hairs; petioles stout, nearly cylindrical, copiously hairy, slightly flattened above. Stem arboreous, from 3ft. to 12ft. high, round, divided at the top *h.* 4ft. to 8ft. in cultivation. Peru. An elegant plant. (S. B. F. G. ii. 272, under name of *Brugmansia sanguinea.*)

FIG. 620. MATURE FRUIT OF DATURA STRAMONIUM.

FIG. 621. BRANCH OF DATURA STRAMONIUM, with Flowers and Fruit.

D. Stramonium (Stramonium). Thorn Apple. *fl.* white. July. *l.* ovate, angularly-toothed, cuneiform at the base, smoothish, green. *h.* 2ft. England. Annual. See Figs. 620 and 621. (Sy. En. B. 935.)

D. suaveolens (sweet-scented).* *fl.* white, sweet-scented, large. August. *l.* elliptic-oblong, quite entire, glabrous above, and scarcely downy beneath. *h.* 10ft. to 15ft. Mexico, 1733. A very handsome greenhouse tree or shrub, much more extensively grown than any other member of the genus. SYN. *Brugmansia suaveolens.*

D. Tatula (Tatula). *fl.* violaceous. July. *l.* cordate-ovate, angularly toothed, unequal at the base, glabrous. *h.* 2ft. to 3ft. America, 1629. Annual. (S. B. F. G. 83.)

D. Wrightii (Wright's). A synonym of *D. meteloides.*

There are several good garden forms in cultivation; the best perhaps being *D. Knightii*, a very handsome conservatory plant, with large double white pendulous flowers.

DAUBENTONIA. *See* **Sesbania.**

DAUBENYA (named after Dr. Charles Daubeny, a former Professor of Botany, at Oxford). ORD. *Liliaceæ*. A genus of pretty and curious little greenhouse bulbs, producing their flowers in very shortly-stalked, densely-flowered umbels, larger than a crown piece. There are three species, natives of the Cape of Good Hope; at present, they probably do not exist in British gardens. They thrive in a soil composed of sandy loam and peat. Increased by offsets. Daubenyas should be quite dry while at rest.

D. aurea (golden). *fl.* yellow; perianth tuberose, with a two-lipped limb. June. *l.* oblong, seated close to the earth. *h.* 3in. 1832. (B. R. 1813.)

D. fulva (tawny). *fl.* dull reddish-yellow. June. *h.* 6in. 1836. (B. R. 1839, 53.)

DAUCUS (*Daukos*, of Dioscorides, is said to be from *daio*, to make hot; from its supposed effect in medicine). Carrot. ORD. *Umbelliferæ*. For culture, *see* **Carrot.**

D. Carota. Carrot. *fl.*, umbels white, peduncled; central purplish; bracts of involucre usually pinnatifid; bracteoles lanceolate. Summer. *l.* pinnately decompound; segments small, rather hairy. *h.* 1ft. to 2ft. Europe (Britain), North Africa, North and West Asia, to India. Biennial.

There are about a score other species, but none are worth mention, either as ornamental or useful plants.

DAVALLIA (named after E. Davall, a Swiss botanist). Including *Acrophorus*, *Humata*, *Leucostegia*, *Loxoscaphe*, *Microlepia*, *Odontoloma*, *Prosaptia*, *Saccoloma*, *Scyphularia*, and *Stenoloma*. ORD. *Filices*. A large genus of greenhouse ferns, upwards of a hundred being described in "Synopsis Filicum." Rhizomes creeping, scaly. Involucre terminal on the veins, various in shape, united or free at the sides; the apex always free. Capsules stalked. Sori intra- or sub-marginal, globose or elongated either laterally or vertically. For general culture, *see* **Ferns.**

FIG. 622. DAVALLIA AFFINIS.

D. affinis (related).* *rhiz.* thick, densely scaly. *sti.* 4in. to 9in. long, erect. *fronds* 1ft. to 2ft. long, 6in. to 12in. broad, deltoid-lanceolate, tri- or quadripinnate; lower pinnules with oblong-rhomboidal lobes, the segments of which are deeply inciso-pinnatifid. Ceylon, &c. See Fig. 622. (H. S. F. 1, 52.)

D. alata (winged). A synonym of *D. Emersoni*.

D. alpina (alpine). *rhiz.* creeping, scaly. *sti.* 2in. to 4in. long. *fronds* 2in. to 3in. long, 1in. to 1½in. broad, deltoid in outline; upper segments of barren frond slightly dentate, blunt at the

Davallia—*continued.*

FIG. 623. DAVALLIA ALPINA.

apex of the fertile fronds, distant, deeply, and sharply toothed; the lower ones cut nearly to the rachis with sharply-toothed lobes. *sori* placed in the teeth on both sides. Java, Borneo. See Fig. 623.

D. angustata (narrow). *rhiz.* creeping, scaly. *fronds* sub-sessile, 3in. to 8in. long, ¼in. to ⅝in. broad, linear, slightly crenate at the margin; barren ones entire. *sori* in a row along the edges. Malay Peninsula.

D. bullata (blistered-leaved). *rhiz.* creeping, stout, densely fibrillose. *sti.* strong, erect, 3in. to 4in. long. *fronds* 8in. to 12in. long, 4in. to 8in. broad, deltoid, quadripinnatifid; pinnules of the lower pinnæ lanceolate, 2in. to 3in. long, with deeply inciso-pinnatifid oblong-rhomboidal segments. *sori* deeply half cup-shaped. East Indies, &c. (H. S. F. 1, 50 B.)

D. calvescens (naked). A synonym of *D. marginalis*.

D. canariensis (Canaries).* Hare's-foot Fern. *rhiz.* creeping, densely scaly. *sti.* strong, erect, 4in. to 6in. long. *fronds* 1ft to 1½ft. long, 9in. to 12in. broad, deltoid, quadripinnatifid; pinnules of the lower pinnæ lanceolate-deltoid, 2in. to 3in. long, more than 1in. broad, with ovate-rhomboidal deeply inciso-pinnatifid segments. *sori* occupying a whole ultimate division. Spain, &c. This fern derives its popular name from the peculiar form of the rootstock, which curves over the side of the pot in which it grows, and, being covered with close brown hair, it very much resembles a hare's foot. (H. S. F. 1, 56 A.)

D. chærophylla (Chervil-leaved). *rhiz.* wide-creeping, scaly. *sti.* 4in. to 6in. long, naked. *fronds* 9in. to 15in. long, 4in. to 8in. broad, lanceolate-deltoid, tri- or quadripinnatifid; lowest pinnules 1in. to 2in. long, 1in. broad, cut into deeply pinnatifid segments; ultimate lobes narrow and acute in the fertile, rather broader in the barren, frond. *sori* copious. North India. SYN. *D. pulchra*. (H. S. F. 1, 51 A.)

D. dissecta (dissected).* *rhiz.* stout, wide scandent, densely scaly. *sti.* 6in. long, naked. *fronds* 1ft. to 1½ft. long, deltoid, quadripinnatifid; pinnæ stalked, lanceolate, the lowest deltoid, 5in. to 6in. long; pinnules close, deltoid, sub-sessile; segments oblong, deeply pinnatifid. *sori* minute, oblong. Java, 1855. (G. C. 1855, 469.)

D. divaricata (divaricate). *rhiz.* creeping, stout, scaly. *sti.* firm, erect, 6in. to 12in. long. *fronds* 2ft. to 3ft. long, tripinnatifid; lower pinnæ often 12in. long by 6in. broad; segments deltoid, or cut down to the rachis in the lower part. *sori* half cup-shaped. Malay Archipelago. SYN. *D. polyantha*. (H. S. F. 1, 59 A.)

D. dubia (doubtful). *fronds* ample, deltoid, quadripinnatifid; pinnæ oblong-lanceolate, 1ft. or more long, 2in. to 4in. broad; pinnules close, lanceolate, stalked, with close oblong sessile segments, the lower pinnatifid, upper entire. *sori* minute, one to each final lobe. Australia. (H. S. F. 1, 24 C.)

D. elegans (elegant).* *rhiz.* stout, creeping, densely fibrous. *sti.* firm, erect, 4in. to 8in. long. *fronds* 1ft. to 2ft. long, 9in. to 15in. broad, deltoid, tripinnatifid; pinnules of the lower pinnæ 2in. to 3in. long, 1in. broad, deltoid-lanceolate, cut down to the rachis on the lower part with oblong-deltoid segments, which are slightly toothed. *sori* several to a segment, marginal. Tropics of Old World.

D. e. elata (tall) is a form with larger and less leathery fronds, the segments of which are narrower, more deeply and sharply cut. (H. S. F. 1, 55 A.)

D. e. flaccida (feeble) is a tender, finely-cut form.

Davallia—*continued.*

D. Emersoni (Emerson's). *fronds* tufted, sessile, 6in. to 12in. long, nearly 1in. broad at the widest part, linear-lanceolate, cut into numerous linear-oblong lobes. *sori* one to six, placed around the edge of the lobes. Madras. SYN. *D. alata.*

FIG. 624. DAVALLIA FIJENSIS.

D. fijensis (Fiji).* *rhiz.* creeping, stout, densely fibrillose. *sti.* 6in. to 9in. long, erect, strong. *fronds* 1ft. to 1½ft. long, 6in. to 12in. broad, deltoid, quadripinnatifid; pinnules of the lower pinnæ deltoid-lanceolate; the lobes of the segment cut down nearly to the rachis into linear divisions. *sori* half cylindrical. Fiji, 1879. See Fig. 624.

D. firma (firm). A synonym of *D. hirta.*

D. fumarioides (Fumaria-like). *rhiz.* creeping, stout, fibrillose. *sti.*, including rachis, 4ft. long, scandent, spinoso-flexuose. *fronds* tripinnatifid; lower pinnæ 1ft. to 1½ft. long, 4in. to 6in. broad; segments small, deeply cut; lobes usually only one-veined. *sori* cup-shaped, as broad as the segment. West Indies.

D. gibberosa (swollen-rooted). *sti.* tufted, 6in. to 12in. long, erect, naked. *fronds* 1ft. to 1½ft. long, 6in. to 9in. broad, lanceolate-deltoid, quadripinnatifid; pinnules of lower pinnæ lanceolate-deltoid, 2in. to 3in. long, 1in. broad; segments cut down to the rachis. *sori* terminal in the ultimate divisions. Polynesian Islands, 1825.

FIG. 625. DAVALLIA HETEROPHYLLA.

Davallia—*continued.*

D. Griffithiana (Griffith's). *rhiz.* wide-creeping, densely scaly. *sti.* erect, wiry, elongated. *fronds* deltoid, with an attenuated apex, 9in. to 12in. long, 4in. to 8in. broad; pinnæ acuminate; pinnules oblong-lanceolate, obtuse; lobes short and blunt. *sori* large, cup-shaped, sub-marginal. Assam. (H. S. F. 1, 49 B.)

D. hemiptera (half-winged). A synonym of *D. repens.*

D. heterophylla (variable-leaved). *rhiz.* creeping, scaly. *fronds* shortly stalked, 3in. to 6in. long, 1in. broad, glabrous; barren one ovate-lanceolate, entire, or slightly lobed at the base; fertile one narrower, and deeply sinuato-pinnatifid. Malayan Peninsula. See Fig. 625.

D. hirta (hairy).* *sti.* strong, 1ft. to 2ft. long. *fronds* 3ft. to 6ft. long, 1ft. to 2ft. broad, deltoid, tri- or quadripinnatifid; lower pinnæ 6in. to 12in. long, 3in. to 4in. broad, ovate-lanceolate, pinnules lanceolate, cut down to the rachis into oblong, broadly toothed lobes. *sori* two to twenty to a segment. North India, &c. SYNS. *D. firma* and *D. scaberula.*

D. immersa (immersed). *rhiz.* creeping, stout, fibrillose. *sti.* 4in. to 8in. long, strong, erect. *fronds* 1ft. to 1½ft. long, 6in. to 9in. broad, deltoid, tripinnate; lowest pinnules lanceolate, deltoid, 2in. to 3in. long, 1in. broad, with broad segments. *sori* large, one to six to a segment. Hindostan, &c.

D. khasyiana (Khasyan). A synonym of *D. strigosa.*

D. lonchitidea (Lonchitis-like). A synonym of *D. platyphylla.*

D. marginalis (marginal). *rhiz.* creeping, villous. *sti.* 1ft. to 2ft. long, erect, strong. *fronds* 1½ft. to 2ft. long, 9in. to 15in. broad, pinnate; pinnæ 4in. to 8in. long, about 1in. broad, linear, cut down into bluntish oblong lobes. *sori* two to eight to a lobe, sub-marginal. Ceylon. SYNS. *D. calvescens, D. scabra,* and *D. villosa.* (H. S. F. 1, 48 B.)

D. Mariesii (Maries).* A pretty dwarf evergreen species, with slender creeping rhizomes. It is well suited for the cool greenhouse. In general aspect, much like *D. bullata.* Japan, 1879.

D. Mooreana (Moore's). A synonym of *D. pallida.*

D. Novæ-Zelandiæ (New Zealand). *rhiz.* creeping, scaly. *sti.* 4in. to 8in. long, firm, erect. *fronds* 1ft. to 1½ft. long, 4in. to 8in. broad, deltoid, tripinnate; lower pinnules deltoid-lanceolate, cut down to the rachis, except toward the apex, into narrow, deeply pinnatifid segments. *sori* numerous. New Zealand. SYN. *Acrophorus hispidus.*

D. pallida (pale).* *rhiz.* as thick as a finger, wide-creeping, scaly. *sti.* 1ft. to 1½ft. long, naked. *fronds* 2ft. to 3ft. long, sub-deltoid, quadripinnatifid; pinnæ deltoid, lowest largest, 6in. to 8in. broad; pinnules and tertiary segments deltoid, stalked; ultimate lobes obovate, cuneate, blunt, one to one-and-a-half lines broad; involucres marginal, funnel-shaped. Borneo, 1869. SYN. *D. Mooreana.* See Fig. 626, next page. (G. C. 1869, 964.)

FIG. 627. DAVALLIA PARVULA.

D. parvula (little). *rhiz.* wide-creeping, scaly. *sti.* 1in. to 2in. long, or *fronds* sub-sessile, ¼in. to ¾in. long by ¼in. broad, deltoid in outline, bi- or tripinnate, with all the divisions of the frond almost filiform. *sori* placed at the sinuses of the ultimate forks. Borneo, 1868. See Fig. 627.

D. pectinata (combed). *rhiz.* creeping, scaly. *sti.* 2in. to 4in. long, erect, scaly. *fronds* 4in. to 8in. long, 2in. to 3in. broad, ovate-lanceolate, deeply cut into long parallel linear-oblong, entire, or inciso-pinnatifid pinnæ. *sori* obliquely placed in two sub-marginal rows. Tropical Polynesian Islands.

D. pedata (pedate). *rhiz.* creeping, scaly. *sti.* 2in. to 4in. long, rather scaly. *fronds* 2in. to 4in. long, 1½in. to 2in. broad at the base, deltoid in outline, deeply cut; upper segments linear-oblong, acute, inciso-dentate, lower pair broader. *sori* placed in rows on the teeth on both sides of the lobes. Tropical Asia, &c. (H. S. F. 1, 45.)

D. pentaphylla (five-leaved).* *rhiz.* creeping, stout, densely fibrillose. *sti.* erect, strong, 2in. to 4in. long. *fronds* with a terminal segment, and two to three pairs of lateral pinnæ; terminal segments of fertile fronds linear, 4in. to 6in. long, ½in. broad, those of the barren fronds broader and shorter. *sori* in two rows along the slightly toothed margins. Java, &c.

D. pinnata (pinnate). *rhiz.* creeping, fibrillose. *sti.* strong, erect, 6in. to 12in. long. *fronds* 9in. to 15in. long, 4in. to 8in. broad, with distant linear, slightly toothed pinnæ, 6in. long, ½in. to ¾in.

Davallia—*continued.*

broad. *sori* one to each tooth, small. Malayan Peninsula. *D. serrata*, *D. gracilis*, and *D. Luzonica* are either identical with this species, or else unimportant forms. (H. S. F. 1, 60.)

D. platyphylla (broad-leaved).* *rhiz.* creeping, stout. *sti.* 2in. to 3ft. long, firm, erect. *fronds* 3ft. to 4ft. long, tripinnatifid; lower pinnæ 1ft. to 1½ft. long, 6in. to 9in. broad, lanceolate, with distant linear-lanceolate pinnules, which are deeply cut into broad, bluntish toothed lobes. *sori* two to twelve to a segment. East Indies. SYN. *D. lonchitidea.* (H. S. F. 1, 46 B.)

D. polyantha (many-fruited). A synonym of *D. divaricata.*

D. pulchra (fair). A synonym of *D. chærophylla.*

D. pyxidata (Box-like).* *rhiz.* stout, creeping, densely scaly. *sti.* strong, erect, 4in. to 6in. long. *fronds* 9in. to 18in. long, 6in. to 9in. broad, deltoid, tri- or quadripinnatifid; pinnules of the lower pinnæ lanceolate, 2in. to 3in. long, 1in. broad, with deltoid or

Davallia—*continued.*

deeply cut into unequal-sided, bluntly-toothed, oblong, rhomboidal pinnules. *sori* two to twelve to a pinnule, small. Tropical Asia. SYN. *D. khasyiana.* (H. S. F. 1, 47.)

D. s. rhomboidea (rhomboidal). Similar in texture and hairiness to type, but somewhat larger in all its parts; lower pinnules lanceolate-deltoid, 1½in. long, cut down nearly to the rachis into oblong lobes.

D. tenuifolia (slender-leaved).* *rhiz.* stout, creeping, densely fibrillose. *sti.* strong, erect, 6in. to 12in. long. *fronds* 1ft. to 1½ft. long, 6in. to 9in. broad, ovate, quadripinnatifid; lower pinnæ ovate-lanceolate, 4in. to 6in. long, 2in. to 3in. broad; pinnules lanceolate, their segments cut down to the rachis below with toothed cuneate lobes. *sori* terminal, usually solitary. Tropical Asia.

D. Tyermanni (Tyermann's).* *rhiz.* wide-creeping, densely

FIG. 626. DAVALLIA PALLIDA.

oblong segments. *sori* deeply half cup-shaped in the teeth. New South Wales, 1808. (H. S. F. 1, 55 C.)

D. repens (creeping).* *rhiz.* wide-creeping, climbing. *fronds* simply pinnate, 8in. to 18in. long, ½in. to 1½in. broad; pinnæ ¼in. to ½in. long, about half as broad as deep. *sori* marginal, large. Borneo, &c., 1869. SYNS. *D. hemiptera*, *Odontoloma repens.* See Fig. 628 (next page).

D. scaberula (slightly rough). A synonym of *D. hirta.*

D. scabra (rough). A synonym of *D. marginalis.*

D. solida (solid).* *rhiz.* stout, densely scaly. *sti.* strong, erect, 4in. to 6in. long. *fronds* 1ft. to 2ft. long, 1ft. to 1½ft. broad, deltoid, tripinnatifid; segments ovate-rhomboidal, deeply toothed, narrower and sharper in fertile fronds. *sori* nearly or quite marginal. Isle of Luzon, 1844. (H. S. F. 1, 42.) *D. ornata* is a form with broad, slightly cut segments.

D. strigosa (strigose). *rhiz.* stout, creeping, pubescent. *sti.* erect, strong, 6in. to 12in. long, pubescent. *fronds* 1ft. to 3ft. long, 6in. to 12in. broad, lanceolate, bipinnatifid; lower pinnæ 4in. to 8in. long, about 1in. broad, linear-lanceolate, acuminate, scaly; scales linear, white. *sti.* 2in. to 3in. long, naked, reddish. *fronds* 4in. to 6in. long, deltoid, three to four-pinnatifid; lower pinnæ largest, stalked, deltoid, unequal-sided; lowest pinnules stalked, cuneate-oblong or deltoid, with falcate-deltoid entire upper, and cuneate-oblong pinnatifid lower, segments. *sori* at the base of ultimate lobes, three-quarters of a line broad. West Coast of Africa, 1871. (G. C. 1871, 870.)

D. villosa (hairy). A synonym of *D. marginalis.*

DAVIDSONIA (named after the discoverer of the plant, who first met with it in a sugar plantation). ORD. *Saxifrageæ.* A remarkably handsome stove plant, with an erect habit, and of apparently easy culture. Propagated by portions of stem, inserted in sand or cocoa-nut fibre, under a bell glass, in bottom heat.

D. pruriens (itching).* *l.* alternate, impari-pinnate, 2ft. long, furnished with pungent hairs; pinnæ in five or six pairs, the terminal one about 9in. long; petioles and rachises thickly

Davidsonia—*continued.*

covered with short stiff hairs, and furnished between and below the pinnæ with a narrow, lobate, biserrated, hairy wing. When young, the leaves are of a bright red colour. Australia, 1877.

DAVIESIA (named in honour of the Rev. Hugh Davies, a Welsh botanist). ORD. *Leguminosæ*. A large and elegant genus of greenhouse shrubs or undershrubs, containing fifty-five species, all natives of Australia. Flowers orange-yellow, or red, usually small, in axillary or lateral racemes or pedunculate umbels,

Daviesia—*continued.*

be sown in a slight hotbed, about March. The two species here given are probably amongst the ones most generally grown.

D. latifolia (broad-leaved). *fl.* orange-yellow, small, numerous, in racemes of 1in. to 2in., often flowering from near the base; bracts ovate or oblong, densely imbricate before the flowers are full grown; pedicels rarely exceeding the bracts till after flowering. May. *l.* 2in. to 3in. long, ovate-elliptical or ovate-lanceolate, usually terminating in a callous point. *h.* 2ft. to 5ft. 1805. A glabrous shrub. (B. M. 1757.)

FIG. 628. DAVALLIA REPENS (see page 447).

occasionally reduced to short clusters, or rarely solitary or terminal; calyx teeth short; petals on a slender claw. Leaves alternate, simple, entire, coriaceous or rigid, either flat and horizontal or vertical, or terete and spinescent; stipules none, or very minute. They require a compost of loam and peat, with a little sand, and delight in an airy situation in the greenhouse. Propagated by cuttings, made of firm young shoots, and placed in sand, under a bell glass; or by seeds, when obtainable, which should

D. umbellulata (small-umbelled). *fl.*, racemes in some specimens shorter than the leaves, in others twice as long, flowering from the middle upwards, or at the end only; calyx about one line long, the teeth short and obtuse; petals twice as long as the calyx. April. *l.* lanceolate or linear-lanceolate, ½in. to ¾in. long, one-nerved, flat, not reticulate. Branches sulcate. *h.* 2ft to 4ft. 1816. A slender, much-branched shrub.

DAVYA (named after Sir H. Davy, an eminent chemist). ORD. *Melastomaceæ*. This genus is synonymous with **Meriania** (which *see*).

DAY LILY. *See* **Hemerocallis.**

DEADLY NIGHTSHADE. A common name for *Atropa Belladonna.*

DEAD NETTLE. *See* **Lamium.**

DEADWORT. *See* **Sambucus Ebulus.**

DEALBATE. Covered with an opaque white powder.

DEAL-WOOD. Chiefly the timber of *Pinus sylvestris.*

DEATH'S HEAD HAWK MOTH. *See* **Sphinx atropus.**

DEATH'S HERB. A common name for *Atropa Belladonna.*

DECABELONE (from *deka*, ten, and *belone*, a needle; in reference to the ten filiform processes of the outer corona). ORD. *Asclepiadeæ.* Very showy dwarf greenhouse succulent perennials. For culture, *see* **Stapelia.**

D. Barklyi (Barkly's).* This interesting plant is closely allied to *D. elegans*, the flowers being very similar, but the branches have nearly twice the number of angles; and the two lateral setæ of the spines are more slender, and deflexed instead of erect. It was discovered by Sir H. Barkly, about 1872, growing near the Orange River, Little Namaqualand. (B. M. 6203.)

D. elegans (elegant). *fl.* large, solitary or twin, springing from the base of the young shoots; corolla yellowish-white, spotted with blood-red, funnel-shaped, 2in. long and 1½in. in diameter at the mouth. Stems tufted, seven to nine-angled; on these are placed elevations bearing three-branched spines. *h.* 6in. Angola, 1873. (B. M. 6115.)

DECAISNEA (named in honour of Joseph Decaisne, a distinguished French botanist, for a long time Director of the Paris Jardin des Plantes; born 1807, died 1882). ORD. *Berberideæ.* A monotypic genus. This, perhaps, has not been tried in the open air in this country, but it thrives in any good loamy soil if planted out in a cool conservatory. Propagated by imported seeds; or by cuttings, struck in a cool, damp frame.

D. insignis (remarkable).* *fl.* greenish, in terminal racemes; sepals six, petaloid, narrow, sub-imbricate; petals none. May. *fr.* globose, edible. *l.* pinnate. *h.* 8ft. Sikkim Himalayas, at a great height. An erect shrub. (B. M. 6731.)

DECANDROUS. Having ten stamens.

DECIDUOUS. Falling off. Leaves which are shed annually are said to be Deciduous, as are also trees that annually lose their leaves.

DECIDUOUS CYPRESS. *See* **Taxodium distichum.**

DECKERIA. *See* **Iriartea.**

DECLINATE. Bending downwards.

DECOMPOUND. A leaf is said to be Decompound when it is twice or thrice pinnate. See Fig. 629.

FIG. 629. DECOMPOUND LEAF (CHAMOMILE).

DECUMARIA (from *decuma*, a tenth; in reference to the tenfold structure of some of the flowers). ORD. *Saxifrageæ.* A very ornamental hardy deciduous twiner, admirably adapted for growing against walls, or on trellis-work. It thrives well in a dry, warm border of light rich soil; and is readily increased by cuttings, which should be made in summer, and placed under a handlight, in a shady situation.

D. barbara (wild).* *fl.* white, very sweet-scented, disposed in terminal corymbs. June. *l.* opposite, glabrous, ovate-oblong, acute at both ends. South United States, 1785. SYN. *D. sarmentosa.*

D. sarmentosa (twiggy). A synonym of *D. barbara.*

DECUMBENT. Lying on the ground.

DECURRENT. Running down. A leaf is said to be Decurrent when it extends down the leafstalk or stem.

DECUSSATE. Leaves and branches are said to be Decussate when they cross each other at right angles, forming a kind of square, or four angles.

DEFLEXED. Bent downwards.

DEFOLIATION. The shedding of the leaves.

DEHERAINIA (named after Pierre Paul Deherain, Assistant Naturalist of the Museum of the Jardin des Plantes). ORD. *Myrsinaceæ.* An interesting and remarkable stove shrub, thriving in rich sandy loam and fibrous peat. Heeled cuttings of ripened shoots will root in sand, if placed under a glass, in bottom heat.

D. smaragdina (emerald-green). *fl.* green, about 2in. in diameter, Primrose-like, disposed in clusters concealed below the leaves. *l.* oblong-lanceolate, serrulate, hirsute along the nerves. *h.* 3ft. Mexico, 1876. SYN. *Theophrasta smaragdina.* (B. M. 6373.)

DEHISCENT. Gaping; opening. An expression often applied to the mode in which the anthers or the fruits burst open and discharge their contents.

DELABECHEA (named in honour of the late Sir H. T. De la Bêche, an eminent geologist). Bottle-tree of North-eastern Australia. ORD. *Sterculiaceæ.* This genus is now included by Bentham and Hooker under **Sterculia** (which *see*).

DELARBREA (named after M. Delarbre, a French naturalist). ORD. *Araliaceæ.* A genus containing two species of stove evergreen tall shrubs, natives of New Caledonia. For culture, *see* **Aralia.**

D. spectabilis (notable). This is the correct name of plant described in this work as *Aralia concinna.*

DELIMA (from *delimo*, to shave off; in reference to the leaves being used for polishing). SYN. *Trachytella.* ORD. *Dilleniaceæ.* A handsome stove evergreen climbing shrub, with the habit of *Tetracera.* It thrives in a compost of peat and turfy loam, to which may be added a little silver sand and small pieces of charcoal. Cuttings of young shoots will root, if inserted in sand and placed in bottom heat, in April. Perfect drainage is essential.

D. sarmentosa (twiggy). *fl.* white, in terminal panicles. *l.* obovate, ovate, or broadly lanceolate, rigid, very scabrid, parallel-veined. Tropical Asia, 1820.

DELOSTOMA (from *delos*, manifest, and *stoma*, a mouth; in allusion to the wide mouth of the flower). ORD. *Bignoniaceæ.* A small genus, containing three or four species, all natives of Columbia and Peru. The one described below is a handsome, robust-growing stove tree. For culture, *see* **Bignonia.**

D. dentatum (tooth-leaved). *fl.* bluish-white, large; corolla sub-campanulate, having a limb nearly 2in. across, of spreading orbicular lobes; racemes erect, three or four-flowered. October. *l.* elliptic-oblong, toothed, downy beneath. Peru.

DELPHINIUM (Greek name used by Dioscorides). Larkspur. ORD. *Ranunculaceæ.* Very ornamental hardy annuals, biennials, or perennials, with erect branching habit. Flowers blue, purple, pink, or white, rarely yellow, racemed or panicled, bracteate; sepals five, petal-like, irregular, the upper one drawn out below into a spur; petals two to four, two upper ones drawn out at the base into appendages within the sepaline spur. Fruit a many-seeded follicle (see Fig. 630). Leaves stalked; cauline ones palmately-multifid. Although the plants belonging to this genus are of very easy cultivation, thriving in almost any position with fair treatment, yet, like most other cultivated subjects, their real beauty and merit can only be estimated by bestowing special attention upon them. The soil should be dug to a good depth (if trenched, so much the better), and a liberal supply of well-rotted manure incorporated. The distance between the plants should be 3ft. each way, if arranged by themselves in beds; or, if placed at the back of a mixed border—a position generally assigned to the tall perennial species or varieties, and one for which they are well adapted—8ft., or even more, may be allowed. The dwarf annuals, when cultivated in pots, are very ornamental for greenhouse decoration.

FIG. 630. DEHISCING FOLLICLE OF DELPHINIUM.

Propagation. All the herbaceous sorts may be increased

Delphinium—*continued.*

by root division, by cuttings, or by seeds. The first-named method is the best for perpetuating named varieties. The old plants should be cut down after flowering, when young growths will proceed from the base, and the whole may be lifted and carefully divided. Seeds of these often take a long time to germinate. Cuttings of the young shoots, taken off in either autumn or spring, root readily if inserted singly in pots, and placed in a cold frame; these will flower the following season, at the same time as the offsets. Seeds of the annual species or varieties may be sown out of doors, in a warm border, in April; or in pans, to be placed either in frames or outside. So soon as the plants are up, they should be pricked off into light, rich soil, where they will make rapid progress. There are numerous and beautiful hybrid varieties, with single, and also many with double, flowers; these are, for the most part, superior to the normal species, the most distinct of which are here described, all being perennials, except where otherwise stated.

FIG. 631. DOUBLE-FLOWERED FORM OF DELPHINIUM AJACIS.

D. Ajacis.* Common Larkspur. *fl.* showy blue, or sometimes reddish or white, not numerous, in terminal racemes, sometimes forming an irregular panicle; spur of the calyx as long as the rest of the flower, or rather shorter; petals two. Summer. *l.*, radical ones shortly stalked; stem ones sessile; all divided into fine linear, deeply-cut segments. Branches few, spreading. *h.* 1ft. to 1½ft. British cornfields (especially round Cambridgeshire). An erect, hairy annual. The specific name is said to have been derived from the supposition that the form of the letters A J A could be traced in the lines on the petals of the flower. In many works on the British Flora, the species *D. consolida* has been confused with this. A double-flowered form is shown at Fig. 631.

D. albiflorum (white-flowered). A synonym of *D. hybridum ochroleucum.*

D. azureum (blue).* *fl.* beautiful sky-blue, large; racemes straight; petals all bearded at the apex, lower ones very villous. May to July. *l.* three to five-parted, many-cleft, with linear lobes; petioles hardly dilated at the base. *h.* 3ft. North-west America, 1805. (B. R. 1999.)

D. Brunonianum (Brown's). *fl.* light blue, shading to purple on the margins, centre black; large. June and July. *l.*, lower ones reniform, but divided into deeply-cut segments; upper ones

Delphinium—*continued.*

tripartite. *h.* 6in. to 1ft. Thibet, 1864. A rare species, having a very strong musky odour. (B. M. 5461.)

D. cardinale (cardinal).* *fl.* bright scarlet, with the petal limbs distinctly yellow; disposed in spikes. August. *l.* smooth, deeply palmately-lobed, rather fleshy. *h.* 3ft. to 4ft. California. A very handsome annual species, remarkably well suited for borders or rockeries, with a good depth of rich soil to facilitate the development of its long fleshy roots. (B. M. 4887.)

D. cardiopetalum (heart-petaled). *fl.* dark bluish-violet; racemes crowded. June. *l.* smooth, ternate, with multifid segments and linear lobes; those of the branches, as well as the lower bracts, are multifid. Stem erect, a little branched. *h.* 1ft. Pyrenees, 1818. Annual.

D. cashmirianum (Kashmir).* *fl.* 1in. to 2in. across, with broad sepals, of a distinct pale blue colour, corymbose. July. *l.* tufted, with long petioles, palmately-lobed, 4in. or more across, deep green, slightly hairy. *h.* 1ft. to 1½ft. Kashmir, 1875. (B. M. 6189.)

D. chellanthum (lip-flowered). *fl.* dark blue; petals shorter than the calyx, two lower ones with obliquely-inflexed, ovate, entire limbs. June to September. *l.* five-parted, with oblong, acuminated, sub-trifid, and somewhat toothed lobes. Stem erect, branched. *h.* 2ft. to 3ft. Dahuria, 1819. (B. R. 473.)

D. consolida (consolidated). *fl.*, racemes rather few-flowered, loose; pedicels shorter than the bracts; petals all combined into one body. Summer. *l.* dissected into narrow linear lobes. *h.* 1ft. to 1½ft. Europe. Annual.

D. dasycarpum (hairy-fruited).* *fl.* beautiful blue, with dark brown petals, rather large; racemes simple, pubescent; pedicels thrice as long as the bracts. June. *l.* pubescent, five-lobed; lobes lanceolate, somewhat trifid, deeply toothed at the apex; petioles not dilated at the base. *h.* 4ft. to 6ft. Caucasus, 1819.

D. elatum (tall). A synonym of *D. exaltatum.*

FIG. 632. FLOWERING BRANCH OF DELPHINIUM EXALTATUM.

D. exaltatum (exalted).* *fl.* blue, or sometimes white, middle-sized; racemes straight; spur straight, length of the calyx; limb of lower petals bifid. Summer. *l.* flat, cleft into three to seven parts beyond the middle, with wedge-shaped lobes, which are trifid or jagged, and acuminated at the apex; petioles not dilated at the base. *h.* 3ft. to 6ft. North America, 1758. SYN. *D. elatum.* See Fig. 632. (B. M. 1791.)

Delphinium—*continued.*

D. formosum (beautiful).* *fl.* sky-blue, shaded with indigo; spur rather long, two-cleft, of a violet hue; sepals longer than the petals; spikes long. Summer. *l.* alternate, greyish-green, unequally palmate, lower segments stalked, upper ones sessile and tripartite. *h.* 1½ft. to 3ft. Orient. (F. d. S. 1185.)

D. grandiflorum (large-flowered).* *fl.* blue, and the intermediate shades to white, either double or single, large; petals shorter than the calyx, two lower ones somewhat orbicular, with obliquely inflexed entire borders; racemes spreading, few-flowered, diverging. June. *l.* palmately many-parted into distant linear lobes. *h.* 1ft. to 2ft. Siberia, 1816. (B. M. 1686.) A very handsome plant, with several varieties, the best of which is perhaps *chinensis*, in which the racemes are many-flowered, lateral ones diverging. Other forms are: *album* (white), *album-pleno* (double-white), *flore-pleno* (double-blue-flowered), *pallidum*, and *rubrum*.

D. hybridum (hybrid). *fl.* blue, with the two lower petals bearded with white; racemes crowded; spur straight, longer than the flowers. June to August. *l.* many-parted, with linear lobes; petioles dilated and sheathing at the base. *h.* 3ft. to 4ft. Tauria, 1794. Lower part of the plant smooth, upper part velvety-pubescent.

D. h. ochroleucum (yellowish-white). *fl.* white, smooth on the outside; racemes elongated, crowded; bracts membranaceous, broad-lanceolate; spur straight, blunt, rather longer than the pedicel. July and August. *l.* many-parted, with linear lobes; petioles dilated and sheathing at the base. *h.* 3ft. Armenia, 1823. SYN. *D. albiflorum.*

D. laxiflorum (loose-flowered). *fl.* blue; racemes loose, branched. June. *l.* three to seven-lobed, with the lobes oblong, acute, deeply pinnatifid; upper ones somewhat three-parted, with narrow, entire lobes; petioles not dilated at the base. *h.* 4ft. to 6ft. Siberia. (B. R. 24, 30.)

D. mesoleucum (white-centred). *fl.* blue, with pale yellow or whitish petals. June. *l.* rather dilated at the base, with wedge-shaped segments, which are deeply serrated at the top. Upper part of the stem, as well as the peduncles, pubescent. *h.* 3ft. Native country unknown. 1822.

FIG. 633. DELPHINIUM NUDICAULE, showing Habit and Single Flower.

D. nudicaule (naked-stemmed).* *fl.* red; petals clear yellow, lower ones spathulate, with a two-cleft, fringed limb, upper ones elongated, prominent, hairy at the ends; spur nearly twice the length of the calyx; raceme loose. Summer. *l.* fleshy, somewhat peltate, tripartite; sub-divisions of lower leaves obcordate with notched lobes, which, in the upper ones, are oblong and entire. *h.* 10in. to 18in. California, 1869. See Fig. 633. (B. M. 5819.)

D. pictum (spotted). A synonym of *D. Requienii.*

D. Requienii (Requien's). *fl.* bluish, hispid; bracts inserted on the middle of the pedicels; spur almost as long as the calyx. June. *l.* on long stalks, lower ones cleft into five broad cuneated three to five-toothed lobes, upper ones divided into five-linear entire lobes. *h.* 1½ft. Lower part of herb smooth, or scarcely pubescent, upper part hispid with long crowded spreading hairs. South-west Europe, 1824. Biennial. SYN. *D. pictum.*

D. Staphysagria (Stavesacre). *fl.* blue, loose, with whitish petals; bracteoles inserted at the base of the pedicels; spur very short; pedicels twice as long as the flower. May. *l.* five to nine-cleft. *h.* 2ft. to 3ft. South Europe, 1596. A large erect biennial herb. (B. M. Pl. 4.)

Delphinium—*continued.*

D. tricorne (three-horned). *fl.* very beautiful blue; petals shorter than the calyx. May. *l.* five-parted, with three to five-cleft lobes, and linear lobules; petioles smooth, hardly dilated at the base. *h.* 9in. North America, 1806. (L. B. C. 306.)

D. triste (sad). *fl.* dark-brown, suffused with a little red at the edges of the sepals, and with a somewhat violaceous spur; racemes loose. July to September. *l.* three to five-parted; lobes narrow, somewhat pinnatifid, acute; upper leaves three-parted, with entire lobes; petioles not dilated at base. *h.* 2ft. Siberia, 1819.

DELTOID. Shaped like the Greek Δ.

DEMIDOVIA. A synonym of **Tetragonia.**

DEMOCRITEA. A synonym of **Serissa.**

DENDROBIUM (from *dendron*, a tree, and *bios* life; the species are epiphytal in their native habitats). SYN. *Pedilonum.* ORD. *Orchideæ.* A large and elegant genus of stove and greenhouse orchids. A few species are very fragrant; but the scent of some is objectionable. Lip more or less contracted at base into a claw, lying upon, or adnate to, the foot of the column; pollinia four. "The genus," says Dr. Lindley, "varies extremely in the habit of its species, some being little larger than the mosses among which they grow, while others are surpassed in stature by few of their order. . . . . There are some species of which the foliage is ancipitous, others having it terete, while, in the majority, it is in the usual flat condition. A few have no other stems than a wiry creeping rhizome; others have small conical pseudo-bulbs; many form clavate horny stems, leafy only at the summit; but the greater part produce long leafy branches."

Cultivation. With but few exceptions, Dendrobiums are very easily managed; but it should be borne in mind by those who undertake their culture, that they require a decided period of rest, or "drying off," as the process is frequently termed. There is considerable diversity in the habit and style of growth of the various members of this genus; and, as many of the kinds not only thrive best, but display their beauties to a greater advantage, when suspended from the roof either in baskets or upon blocks of wood, it will at once be obvious that by this means a large saving of space may be effected. When placed in baskets, they should be surrounded with a little rough peat and sphagnum; but, when grown upon blocks, sphagnum only should be used, and this must be fastened with some fine copper wire, which will also serve to fix the plant firmly. In putting orchids upon blocks, it is of the highest importance that they should be firmly fixed; if this is not done, they are apt to get their first roots damaged; but, as a rule, after they are once established, the roots will hold them tightly enough. Plants cultivated upon blocks require greater attention in the matter of water than those grown in pots. During the growing season, Dendrobiums should be sprinkled with the syringe twice each day, morning and evening being the best times to perform the operation; in addition, it will also be necessary to lift them down twice or three times a week, and give them a dipping in a tub of water. This requires care, in order to preserve the roots and young immature growths from injury; for, at this period, both roots and shoots are very tender and brittle. It must be remembered, in syringing, dipping, or otherwise, that cold water is highly injurious; therefore, it should be warmed to the same temperature as that of the house. As the growths reach maturity, withhold the water supply, and remove the plants into a cooler and drier atmosphere, with full exposure to light and sunshine, to thoroughly ripen them. Water must be very cautiously applied during the resting period, as it is liable to start the plants prematurely. Sufficient only must be given to prevent shrivelling.

Dendrobiums in pots should be planted in equal parts fibrous peat and sphagnum, with a liberal addition of charcoal. They require to be elevated upon a cone of soil above the rim of the pot, and should be pressed down, or potted firmly. Perfect drainage is absolutely essential

Dendrobium—*continued.*

to success. In pots, they enjoy a liberal supply of water during their period of growth; but care must be exercised when syringing, as the water is apt to lie in the sheaths of the young pseudo-bulbs, and cause injury. The plants are subject to the attacks of Yellow Fly when young, and to Scale when they are mature. The first-named pest must be exterminated on its earliest appearance, by slight fumigations with tobacco or tobacco-paper; and the Scale should be carefully washed off with a mixture of soft soap and tepid water.

Dendrobiums, when in flower, may be used for almost any purpose of decoration. They beautify the plant house, the majority of them lasting several weeks in perfection, if not sprinkled with water from the syringe. They may be taken into the dwelling house, and will be found charming subjects for the drawing-room or boudoir; while many of them take first rank as subjects for exhibition.

The enumeration of species is confined to such as are of known excellence, or are offered in trade lists. Many species, and some of the varieties and hybrids that are periodically figured and described at length, are frequently rare and often unique; and, for various reasons, it is probable that the majority of these do not become common or obtainable for many years afterwards. To give anything like an exhaustive review of the entire genus would, in itself, amount to a moderate-sized volume.

D. aduncum (hooked). *fl.* white, tinged with rose, small, appearing at different times of the year. *h.* 2ft. Manilla, 1842. An evergreen species, with a rather straggling habit. (B. R. 1846, 15.)

D. aggregatum (clustered).* *fl.* deep yellow throughout, borne in arching racemes about 6in. long. March to May. Pseudo-bulbs thick and deep green, bearing a solitary leaf. *h.* 3in. to 4in. Northern India, 1837. Greenhouse. This plant is best grown fastened on a large block of wood. (B. R. 1695.) The variety *majus* is a very good one.

D. albo-sanguineum (white and crimson).* *fl.* soft creamy-white, twin or tern, very large, about 4in. across; petals twice as broad as the sepals, with a few blood-red streaks at the base; labellum with a large reddish-crimson blotch in the middle. May and June. Pseudo-bulbs from a few inches to 1ft. long, and nearly 1in. in diameter. Moulmein, 1851. Stove. (P. F. G. 57.)

D. album (white). A synonym of *D. aqueum.*

D. amœnum (pleasing). *fl.* pure white, tipped with violet-purple, scattered along the long slender stems, violet-scented; throat yellow; labellum white, with a slight tinge of magenta at the base. Pseudo-bulbs 1ft. to 1½ft. long. Himalaya, 1843. A slender-growing pendulous stove deciduous species. (B. M. 6199.)

D. Aphrodite (Aphrodite).* *fl.* amber, produced sparingly from the nodes of the last matured growth; lip bright orange, margined with white, and with a large blood-red spot at the base. July. Pseudo-bulbs 4in. to 8in. high, ½in. in diameter through the very prominent nodes, which are a distinguishing feature in the present species. Moulmein, 1862. Erect greenhouse deciduous species. SYN. *D. nodatum.* (F. d. S. 1582.)

D. aqueum (watery). *fl.* creamy-white, solitary or two together, large, rising from the axils of the leaves; lip recurved from the middle, ovate-rhomboid, obscurely three-lobed; two lateral lobes small, the intermediate one triangular; the lower half has an elevated ridge, and under its termination a depression, and that part has a deep yellow blotch; under side glabrous, the upper surface very downy and striated, the margin of the terminal lobe fringed with soft ciliæ. November. *l.* distichous, ovate, the upper ones smaller and lanceolate, all sub-membranaceous, sharply and suddenly acuminated, striated with the longitudinal nerves, dark green above, paler and yellower beneath. Stem stout, jointed, compressed, striated, leafy (at the time of flowering), yellow-green. Bombay, 1842. Stove. (B. M. 4640.) SYN. *D. album.*

D. aureum (golden).* *fl.* amber, produced from the nodes of two-year-old pseudo-bulbs, in bunches of from four to six, very fragrant; lip amber, with brown and purple markings. February. Pseudo-bulbs 1ft. to 1½ft. long, ¾in. in diameter. India, 1837. A pendulous stove or greenhouse deciduous species. SYN. *D. heterocarpum.* (B. M. 4708.) The variety *philippinensis* is a remarkable long-stemmed form, with slightly scented Primrose-coloured flowers. 1880.

D. barbatulum (small-bearded). *fl.* ivory-white, with a slight tinge of pink, small, in dense erect racemes. East Indies, 1844. A robust greenhouse plant, attaining about 1ft. in length, and succeeding best on a block of wood. (B. M. 5918.)

D. Bensoniæ (Benson's).* *fl.* about 2in. across, produced in twos or threes at the end of the stem; sepals and petals waxy-white; lip white, with an orange centre, and ornamented near the base with two large velvety-black blotches. May and June. Burmah, 1867. An erect, stiff-growing, greenhouse deciduous species, with pseudo-bulbs 1ft. to 1½ft. long, and about ½in. in diameter. (B. M. 5679.) Two varieties of this fine plant have been introduced: *aurantiacum* (orange, brown), Moulmein, 1874; and *xanthinum* (white, yellow), 1878.

D. bigibbum (double-spurred).* *fl.* rich rosy-pink, 1in. to 2in. across, disposed in six to twelve-flowered arching spikes, which are produced from the leafy part of one-year and older bulbs. September and October. Pseudo-bulbs 1ft. to 1½ft. long, carrying on their upper part from four to six closely-arranged leaves. *h.* 1ft. Queensland. An erect-growing stove evergreen species. (B. M. 4898.) The variety *superbum* grows somewhat stiffer and stouter than the type, and has superior flowers, both in size and colour. 1878. (F. M. n. s. 229.) There is also a form (*candidum*) with white flowers.

D. binoculare (two-eyed). *fl.* copper-coloured, rather small; apex of the lip golden-yellow, with one large brownish or purplish blotch on each side of its disk; raceme sub-erect. Summer. Burmah, 1869. A tall, slender-growing greenhouse species.

D. Boxallii (Boxall's).* *fl.* scattered along the previous year's knotty growth, 2in. across; sepals and petals white, beautifully tipped with purple; lip same colour, with a large blotch of rich yellow. February and March. Pseudo-bulbs from 2ft. to 3ft. long, and ¼in. through the nodes. Moulmein. An elegant stove deciduous species, particularly adapted, from its pendulous habit, for growing on a block, although it thrives well under pot culture. (F. M. n. s. 114.)

D. Brymerianum (Brymer's).* *fl.* solitary or in pairs, or in short spikes of threes and fours from the upper part of two-year and older bulbs; sepals and petals glossy yellow; lip yellow, furnished with a very deep, branched, papillose fringe. March and April. *l.* about 5in. long and 1in. broad, light green. Pseudo-bulbs 2ft. high, and ½in. in diameter, bearing from eight to twelve leaves. Burmah, 1875. A very remarkable and handsome erect-growing stove evergreen species. (B. M. 6383.)

D. Bullerianum (Buller's). A synonym of *D. gratiosissimum.*

D. Calceolaria (slipper-like). *fl.* of a uniform bright yellow, large, produced on a raceme twelve or more together. Summer. Pseudo-bulbs about 4ft. high. India, 1820. A large-growing stove evergreen species. Its name is usually misspelt *D. Calceolus.*

D. Cambridgeanum (Duke of Cambridge's). A synonym of *C. ochreatum.*

D. canaliculatum (channelled). *fl.* sweet-scented, disposed on a stem about 1ft. long; sepals and petals yellow and white; lip white, with a mauve disk. *h.* 3in. North-east Australia, 1865. A pretty little greenhouse species, of easy culture. SYN. *D. Tattonianum.* (B. M. 5537.)

D. cariniferum (keel-bearing).* *fl.* white, in branches of four or more from one-year and older bulbs; sepals tinged with yellow at the tips; labellum orange, tipped with white, and furnished with a cinnabar-red crest. April. Pseudo-bulbs erect, evergreen, 1ft. long by ½in. in diameter. Burmah, 1869. Greenhouse.

D. c. Wattii (Watt's). This differs from the type in its larger flowers, rather longer spur, the longer narrow mid-lobe, the yellow bands of the lip, and the faintly hairy sheaths. Munipore, 1883. (B. M. 6715.)

D. chlorops (green-eyed). *fl.* pale nankeen-colour; base of lip bright pea-green, small. Bombay, 1842. A very pretty free-flowering stove species.

D. chrysanthum (golden-flowered).* *fl.* deep rich yellow, in twos and threes on the leafy stems; labellum fringed, and having a dark crimson blotch. September. Pseudo-bulbs from 3ft. to 6ft. long, about ½in. in diameter. Nepaul, 1828. A handsome greenhouse deciduous species, most successfully grown in a basket, suspended from the roof. (B. R. 1299.) The variety *microphthalmum* has the fringe of lip very short, blotches two or four, pallid brown, 1879.

D. chrysotis (golden).* *fl.* about 2in. across; sepals and petals long and narrow, rich golden-yellow; lip orange, with two large purple blotches at the base, heavily fringed or bearded; racemes drooping, several springing from one bulb, four to eight-flowered. Summer. Pseudo-bulbs 2ft. to 6ft. long, ½in. in diameter, with dark, rather prominent nodes to every inch or two of the slender, rod-like stem. Assam, 1878. A very magnificent erect stove evergreen species, closely allied to *D. fimbriatum.* (B. M. 6013, under name of *D. Hookerianum.*)

D. chrysotoxum (golden-arched).* *fl.* over 1in. across, produced from the leafy part of both old and young pseudo-bulbs; sepals and petals pale yellow; lip a deeper yellow; raceme drooping, 6in. to 12in. long. March and April. Pseudo-bulbs 1ft. long, and 1½in. in diameter, bearing from four to six stout leaves arranged on the upper part. Moulmein, 1845. A strong, erect stove evergreen species. (B. M. 5053.)

D. clavatum (club-shaped).* *fl.* bright yellow, with a crimson spot in the centre of the lip, produced in drooping spikes from the tops of the stems. Summer. Pseudo-bulbs 1ft. to 3ft. high, and ½in. in diameter. From six to eight leaves clothe the upper part of the stem. Assam, 1851. An erect stove evergreen species, best adapted for growing in pots, in a peat soil. (L. & P. F. G. ii. 189.)

Dendrobium—*continued.*

D. crassinode (thick-knotted).* *fl.* from the last matured growth, each node producing from two to four stout blossoms; sepals and petals waxy-white, tipped with rich purple; lip white, with an orange blotch at the base. February and March. Pseudo-bulbs 1ft. to 1½ft. long, and ½in. in diameter. Burmah, 1868. This species is remarkable for the enormously swollen joints of the stem, which are 1in. in diameter, and arranged about 1in. apart. A pendulous stove deciduous species, best grown in a small basket or on a block of wood. (B. M. 5766.) There are two or three very good varieties, including *albiflorum*, pure white, with a dark yellow disk; and *Barberianum*, a great improvement on the type, with more highly-coloured flowers, which are of greater substance, the pseudo-bulbs also are stouter.

D. crepidatum (slippered). *fl.* from the last matured growth, two and three together, about 2in. across, on somewhat long footstalks; sepals and petals white, tipped with pink; lip stained with yellow. March. Pseudo-bulbs 1ft. to 1½ft. long, with white lines running their entire length. Assam. A very handsome drooping greenhouse deciduous species, well suited for growing in a basket or on a block. (B. M. 4993.)

D. cretaceum (chalked). *fl.* chalky-white, solitary from the joints of the long leafless stems, rather small, downy; lip with a pale yellow disk, pencilled with crimson; margin ciliated. May. Pseudo-bulbs 8in. to 14in. long, ½in. in diameter. India, 1846. A compact-growing pendulous stove deciduous species. (B. M. 4686.)

D. crystallinum (crystalline).* *fl.* of moderate size, freely produced from the last matured growth; sepals and petals white, tipped with rose or purple; lip orange at the base, tipped with purple. Summer. Pseudo-bulbs 1ft. to 1½ft. long, ½in. in diameter. Burmah, 1868. An erect-growing stove deciduous species, allied to *D. Bensoniæ*. (B. M. 6319.)

D. cucullatum (hooded). *fl.* 1½in. to 2in. in diameter, suffused with a pale pink tint; lip pale yellow. India, 1835. Very closely allied to *D. Pierardii*, from which it is principally distinguished by the lip being more ovate in form and more open at the base, the sides not being rolled round the column to half the extent they are in *D. Pierardii*, to which, however, the present species is inferior from a horticultural point of view. Greenhouse. (B. M. 2242.)

D. cupreum (coppery). A synonym of *D. moschatum*.

FIG. 634. FLOWER OF DENDROBIUM DEVONIANUM.

D. Dalhousianum (Lady Dalhousie's).* *fl.* large, 3in. to 5in. across; sepals and petals buff, shaded with pale lemon; lip of the same colour, spotted at the base with two large blotches of dark crimson, and margined with rosy-pink; racemes drooping, produced from the growth of the previous year, six to ten-flowered. April and May. Pseudo-bulbs stout, erect, 3ft. to 5ft. high, about 1in. in diameter, with purple lines running their entire length. India, 1837. A noble strong-growing stove evergreen species, requiring, however, a considerable space to grow it in anything like perfection. (P. M. B. xi. 145.)

D. densiflorum (dense-flowered).* *fl.* rich clear amber, produced in numerous long dense pendulous racemes, which spring from immediately below the junction of leaf and stem; lip orange, delicately fringed. April and May. Pseudo-bulbs somewhat club-shaped, about 1ft. in height, furnished near the apex with several broad, oblong, deep green, shining leaves. India, 1829. A very handsome free-flowering stove evergreen species. (B. R. 1828.)

D. d. albo-luteum (white and yellow). A very floriferous form, differing from the type "in the greener, glossier pseudo-bulbs and leaves, and in the long lax panicle and colourless transparent sepals and petals," which are sometimes tinged with pink; lip

Dendrobium—*continued.*

wholly orange, or orange-red. Moulmein. SYN. *D. thyrsiflorum*. (B. M. 5780.)

D. d. Schrœderi (Schrœder's). This hardly differs from the last-named variety, except in the purer white of the flowers, and the golden labellum gradually shading off towards the margin into a paler yellow. India, 1870.

D. Devonianum (Duke of Devonshire's).* *fl.*, sepals and petals soft creamy-white, tinged with pink, the latter in addition being tipped with purplish-magenta; lip white, margined with purple and spotted with rich orange at the base, and bordered all round with a delicate lace-like frill, which gives the plant a charm that is quite unique. Well-grown pseudo-bulbs often carry from ninety to a hundred flowers, which are about 2in. across. March and April. Pseudo-bulbs 1ft. to 3ft. long, ½in. in diameter. East Indies, 1837. A very beautiful pendulous stove deciduous species, sometimes called the King of Dendrobiums. It should be grown either in a basket or upon a block of wood. See Fig. 634. (B. M. 4429.)

D. D. candidulum (white). *fl.* pure white, with a yellow throat. 1876.

D. D. Elliottianum (Elliott's). *fl.*, sepals and petals with much purple on their tips; whole flower veined with rose. 1876.

D. D. rhodoneurum (red-veined). *fl.*, sepals and petals streaked with dark purple; lip large and round. Moulmein, 1868.

D. dixanthum (double-tinted). *fl.* yellow, produced in clusters of from two to four together, on the leafless stems; disk of the lip of a darker hue, about 2in. across. Spring. Pseudo-bulbs about 2ft. high and ½in. in diameter. Moulmein, 1864. An erect, slender-growing, stove deciduous species. (B. M. 5564.)

D. Draconis (Draco).* *fl.* white, moderate-sized, produced from the points of the last matured growths in bunches of six or more; lip with a red base. Pseudo-bulbs 1ft. to 1½ft. high, ½in. in diameter. Moulmein, 1862. Erect stove evergreen. SYN. *D. eburneum*. (B. M. 5459.)

D. eburneum (ivory-flowered). A synonym of *C. Draconis*.

D. erythroxanthum (red-yellow).* *fl.* orange, striped with purple, small, densely clustered, produced from the last matured growth. May and June. Pseudo-bulbs 3ft. to 4ft. high, about ½in. in diameter. Philippines, 1874. A very rare, erect, stove deciduous species.

D. Falconeri (Falconer's).* *fl.* produced from one-year and older nodes; sepals and petals white, tipped with purple; lip same colour, with a centre of dark purple, margined with orange. May. *l.* 3in. long, ¾in. broad. Pseudo-bulbs about 3ft. long, very knotty, much-branched; nodes ¾in. in diameter, very close together. India, 1847. A pendulous stove evergreen, somewhat difficult to cultivate. (B. M. 4944.)

D. F. albidulum (white). *fl.* pure white, slightly tinged with purple at the tips of the sepals, petals, and lip. India, 1876. (B. H. 1874, 15.)

D. F. giganteum (gigantic). *fl.* much the same in colour, &c., as the type. *l.* 3in. long, 1in. broad. Pseudo-bulbs 1ft. to 1½ft. long, unbranched; nodes ¾in. in diameter, about 1in. apart. An erect or semi-erect form.

D. Farmeri (Farmer's).* *fl.* produced upon long pendulous racemes, in the same manner as those of *D. densiflorum*, but not so closely set together; sepals and petals pale straw-colour, delicately tinged with pink, whilst the disk of the lip is of a golden-yellow. May. India, 1847. A beautiful and delicate upright-growing stove evergreen species, attaining about 1ft. in height, bearing several shining dark green leaves towards the top of its club-shaped stems, which are swollen at the base into a kind of pseudo-bulb. See Fig. 635. (B. M. 4659.)

D. F. aureoflavum (golden-yellow). A beautiful variety, distinguished from the type by its bright yellow sepals and petals, and golden lip. Moulmein, 1864. (B. M. 5451.) There is also a white variety, *album*, but both are rare.

D. fimbriatum (fimbriated).* *fl.* about 2in. across, of a thin and delicate texture throughout, deep rich orange; margin of lip beautifully bordered with a golden moss-like fringe; racemes pendulous, six or more flowered, from the upper part of three-year and older pseudo-bulbs. March and April. Pseudo-bulbs 2ft. to 4ft. long, ½in. in diameter, having thirty to forty leaves, which are 6in. long by 1½in. broad. India, 1823. A very showy erect stove evergreen species.

D. f. oculatum (eyed).* A very handsome variety, chiefly differing from the type in having larger flowers, the lips of which are blotched in the centre with deep blackish-purple or dark blood-colour. India. SYN. *D. Paxtoni*. (B. M. 4160.)

D. Findlayanum (Findlay's). *fl.* 2in. to 3in. across, produced from the upper nodes of the last matured pseudo-bulbs; sepals and petals white, tipped with pink; lip white, with a large orange-coloured blotch on the anterior part. January and February. Pseudo-bulbs 1ft. or more high; remarkable for the large egg-shaped nodes, which are over ½in. in diameter and 1in. long. Moulmein, 1877. An erect stove deciduous species. (B. M. 6438.)

D. formosum (beautiful).* *fl.* white, 4in. to 6in. across, of great substance, produced from the point, and also from the axils, of the leaves nearest the point of the pseudo-bulb; lip large,

Dendrobium—*continued.*

white, with an orange throat; spikes three to four, or even eight-flowered. Summer. Pseudo-bulbs 1ft. to 1½ft. high, 1in. in diameter, bearing about eight or ten coriaceous leaves. India, 1837. Stove. (B. R. 1839, 64.)

FIG. 635 DENDROBIUM FARMERI.

D. Fytchianum (Fytch's).* *fl.* borne in graceful racemes, 9in. long, proceeding from the extremity of the upright stems; perianth beautiful white; lip three-lobed; lateral lobes small, oblong, incurved, purplish-rose. January. *l.* slender, linear, falling off before the flowers have had time to expand. Stem about 1ft. long, upright. Moulmein, 1864. Stove. (B. M. 5444, under the name of *D. barbatulum.*)

D. Gibsoni (Gibson's). *fl.* rich orange, produced on the ends of the old pseudo-bulbs; lip bright yellow, with two dark spots on the upper part. Summer. *h.* 2ft. Khasya, 1827. A pretty erect-growing evergreen stove species, closely resembling *D. fimbriatum oculatum*, but the lip is longitudinally plicate. (P. M. B. v., p. 169.)

D. gratiosissimum (most-favoured).* *fl.* usually in pairs; sepals and petals white, shaded and tipped with rose; lip marked with a large yellow spot, which is faintly striped with orange. *l.* ovate-lanceolate, acute. Moulmein, 1867. Stove. SYN. *D. Bullerianum.* (B. M. 5652.)

D. Griffithianum (Griffith's). *fl.* very rich golden-yellow, disposed in immense drooping spikes. May and June. East Indies, 1838. Described as one of the most beautiful of the yellow spring-flowering section, not unlike *D. densiflorum*, but about double the size in all its parts. Stove.

D. hedyosmum (sweet-scented). A synonym of *D. scabrilingue.*

D. heterocarpum (variable-fruited). A synonym of *D. aureum.*

D. Heyneanum (Heyne's). *fl.* white, streaked with violet, small, produced in spikes, from the top of the stems, at different times of the year. Bombay, 1838. A very pretty stove deciduous species, growing about 8in. high, and best cultivated on a block.

D. infundibulum (funnel-shaped).* *fl.* pure ivory-white, large, often 4in. across, produced in bunches of two or more blossoms, from the upper joints; lip serrated, yellow; the bases of the two lateral sepals prolonged into a tapering funnel-shaped spur, about 1in. long. May and June. Pseudo-bulbs 1ft. to 1½ft. long, ½in. in diameter, bearing ten to fourteen strong leaves. Moulmein, 1863. Stove. It thrives best in a pot nearly filled with draining material, and over this a layer of living sphagnum. See Fig. 636. (B. M. 5446.)

D. Jamesianum (James Veitch's) differs only from *D. infundibulum* in having a red, instead of a golden, throat. Moulmein, 1869. Stove. There are several other forms of these two species, the differences of which lie in the colouring of the lip.

D. Jenkinsii (Jenkins's).* *fl.* pale buff, margined with yellow, on short erect spikes of two or three good-sized blossoms, from the centre of two-year and older pseudo-bulbs. March and April. Pseudo-bulbs small, growing thickly together, 1in. long, ½in. in diameter, bearing a solitary, thick and fleshy, dark green leaf, which is almost 1in. long. Northern India, 1838. A charming little greenhouse evergreen for growing on a bare block of wood. (B. R. 1839, 37.)

D. Jerdonianum (Jerdon's). *fl.* cinnabar-red, small, produced in small bunches from the last matured growth; lip dark purple. Pseudo-bulbs about 6in. high. Nilgherries, 1868. Erect stove evergreen.

D. Johannis (John Veitch's). *fl.* small, fragrant; sepals and petals chocolate-brown; lip yellow, with crimson pencillings. North Australia, 1865. A very pretty greenhouse species, but not so showy as many others. (B. M. 5540.)

D. Kingianum (Capt. King's).* *fl.* violet-purple, small; spikes about 6in. long, springing from the leafy part of two-year and older bulbs. February. Pseudo-bulbs tapering, 6in. high, ½in. in diameter at base, crowded together, usually bearing two leaves. Queensland and New South Wales, 1843. Greenhouse. (B. M. 4527.)

FIG. 636. SINGLE FLOWER OF DENDROBIUM INFUNDIBULUM.

Dendrobium—*continued.*

D. lasioglossum (woolly-tongued). *fl.* somewhat small, produced in twos and threes from the joints; sepals and petals creamy-white; lip yellow in the centre and brown at the sides, streaked with purple lines. Pseudo-bulbs 8in. to 12in. long. Burmah, 1868. An erect slender-growing greenhouse species, but rather difficult to cultivate. (B. M. 5825.)

D. Linawianum (Linaw's).* *fl.* pale rosy-lilac, nearly white in the centre, produced freely in pairs; lip tipped with crimson. Winter. *h.* 1ft. or more. China, 1824. A very handsome erect-growing greenhouse evergreen species, requiring pot culture. (B. R. 1314, B. M. 4153, under name of *D. moniliforme.*) There is a variety *majus*, which has larger and richer-coloured flowers.

FIG. 637. SINGLE FLOWER OF DENDROBIUM LITUIFLORUM.

D. lituiflorum (trumpet-flowered).* *fl.* very much like those of *D. nobile*, but smaller; sepals and petals rosy-purple, very acute; lip white, bordered with purple, having a dark purple centre, and remarkable in being curved like a trumpet, with the mouth upwards. April. Pseudo-bulbs 18in. to 20in. long, ½in. in diameter; node-like joints about 1½in. apart. East Indies, 1856. A rare pendulous stove deciduous species, succeeding best when suspended from the roof in a basket of sphagnum. See Fig. 637. (B. M. 6050.)

D. l. candidum (white). *fl.* pure white, with the faintest tinge of green on the lip. 1880. Very rare.

D. l. Freemanii (Freeman's). A deep-coloured form, with zone of labellum yellow, and erect, short, stiff pseudo-bulbs. Assam, 1878.

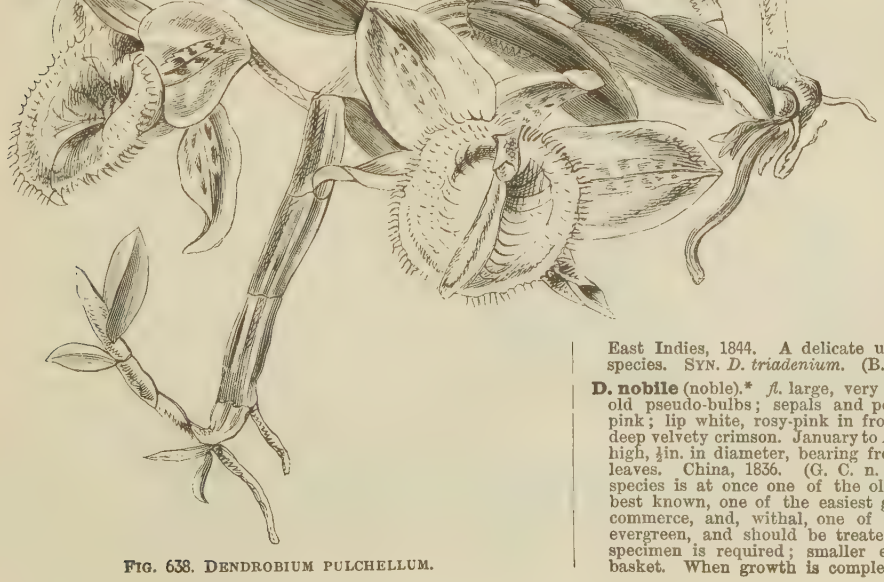


FIG. 638. DENDROBIUM PULCHELLUM.

Dendrobium—*continued.*

D. longicornu majus (large long-spurred).* *fl.* white, fringed, freely produced from the upper part of two-year and older pseudo-bulbs, and from three to six together; lip with a yellow centre. May and June. Pseudo-bulbs 18in. to 20in. high. India. Stove. According to Mr. B. S. Williams, "there are two varieties, but the one now described is the best." Not unlike *D. formosum*, but not so robust in growth. (The type is figured B. R. 1315.)

D. Lowi (Low's). *fl.* bright yellow, with reddish veins on the upper part of the lip, large, 2in. across, produced in racemes from the side of the stem near the top. Summer and autumn. Pseudo-bulbs 1ft. to 1½ft. high, ½in. in diameter. Borneo, 1862. A very distinct erect stove evergreen species, well-grown plants of which are very rare. It succeeds in a pot or basket, or on a block. (B. M. 5303.)

D. luteolum (yellowish).* *fl.* Primrose-yellow, with a little orange and crimson on the lip, 1in. to 2in. across, produced in threes or fours from the upper part of the last-made pseudo-bulbs and branches. March. Pseudo-bulbs 1ft. to 2½ft. long, ½in. in diameter. Moulmein, 1864. An erect (or usually so) greenhouse evergreen. The bulbs of some plants of this species throw out many branches, but there is a variety which makes an erect bulb 30in. high. The first-named form never does well unless, each year, the nodes from which these new growths proceed are brought down so that the roots can enter the peat and sphagnum. (B. M. 5441.)

D. MacCarthiæ (Mrs. MacCarthy's).* *fl.* large, nearly 3in. in length, and somewhat more in width, produced in drooping racemes of from three to five blossoms; sepals and petals very pointed, of a rich cerise-blue; lip lighter, sometimes almost white, 3in. long, scoop-shaped, veined with purple, and with a large dark blotch within. June. Pseudo-bulbs 1½ft. to 2ft. long, ½in. in diameter. Ceylon, 1854. This is difficult to manage; it requires a high, moist, airy atmosphere to grow in, and should then be rested for some weeks in an intermediate temperature. It cannot withstand, even when at rest, a lower temperature than 50deg. (B. M. 4886.)

D. macrophyllum (large-leaved).* *fl.* greenish-yellow, hairy outside, produced in long terminal erect racemes; lip three-lobed, striped and spotted with purple. Philippines, 1838. A tall-growing stove species, with club-shaped stems, which bear two or three broad leaves. (B. M. 5649.)

D. marmoratum (marbled). *fl.* white, tipped with purple; lip purplish, ciliated. Burmah, 1875. A very pretty stove species, allied to *D. transparens.*

D. moniliforme (beaded).* *fl.* white, with a few purple spots on the lip, deliciously fragrant, borne on the upper part of the previous year's leafless stems, in clusters of two or more blossoms from a joint. May. Pseudo-bulbs thin, about 10in. high, clothed with grass-like leaves. China and Japan, 1824. Greenhouse. (B. M. 5482, under name of *D. japonicum.*) The *D. moniliforme* of Lindley (B. R. 1314) is *D. Linawianum.*

D. moschatum (musk-scented).* *fl.* creamy-white, tinged with rose, large, over 2in. across; lip slipper-shaped, pale yellow, base darker, ornamented on each side with a large eye-like blotch of deep blackish-purple; racemes from the upper part of one-year and older pseudo-bulbs, drooping, eight to fourteen-flowered. June. Pseudo-bulbs 3ft. to 5ft. high, ½in. in diameter; from twenty to thirty large leaves clothe the stem. East India, 1828. A very handsome but much neglected stove species, with an erect, evergreen, strong-growing habit. SYN. *D. cupreum.* (B. R. 1779.)

D. mutabile (changeable). *fl.* white, or pinkish-white, with an orange mark on the lip, produced from the old pseudo-bulbs; spikes compactly eight to twelve-flowered. May. Pseudo-bulbs 4ft. to 6ft. long, frequently branched, and very leafy. East Indies, 1844. A delicate upright-growing stove evergreen species. SYN. *D. triadenium.* (B. M. 5285.)

D. nobile (noble).* *fl.* large, very freely produced from two-year-old pseudo-bulbs; sepals and petals white, tipped with rosy-pink; lip white, rosy-pink in front, blotched at the base with deep velvety crimson. January to April. Pseudo-bulbs 2ft. to 3ft. high, ½in. in diameter, bearing from ten to sixteen bright green leaves. China, 1836. (G. C. n. s., xi. 564.) This greenhouse species is at once one of the oldest in cultivation, one of the best known, one of the easiest grown, one of the cheapest in commerce, and, withal, one of the most beautiful. It is an evergreen, and should be treated with pot culture if a large specimen is required; smaller examples may be grown in a basket. When growth is complete, remove it to a cool house,

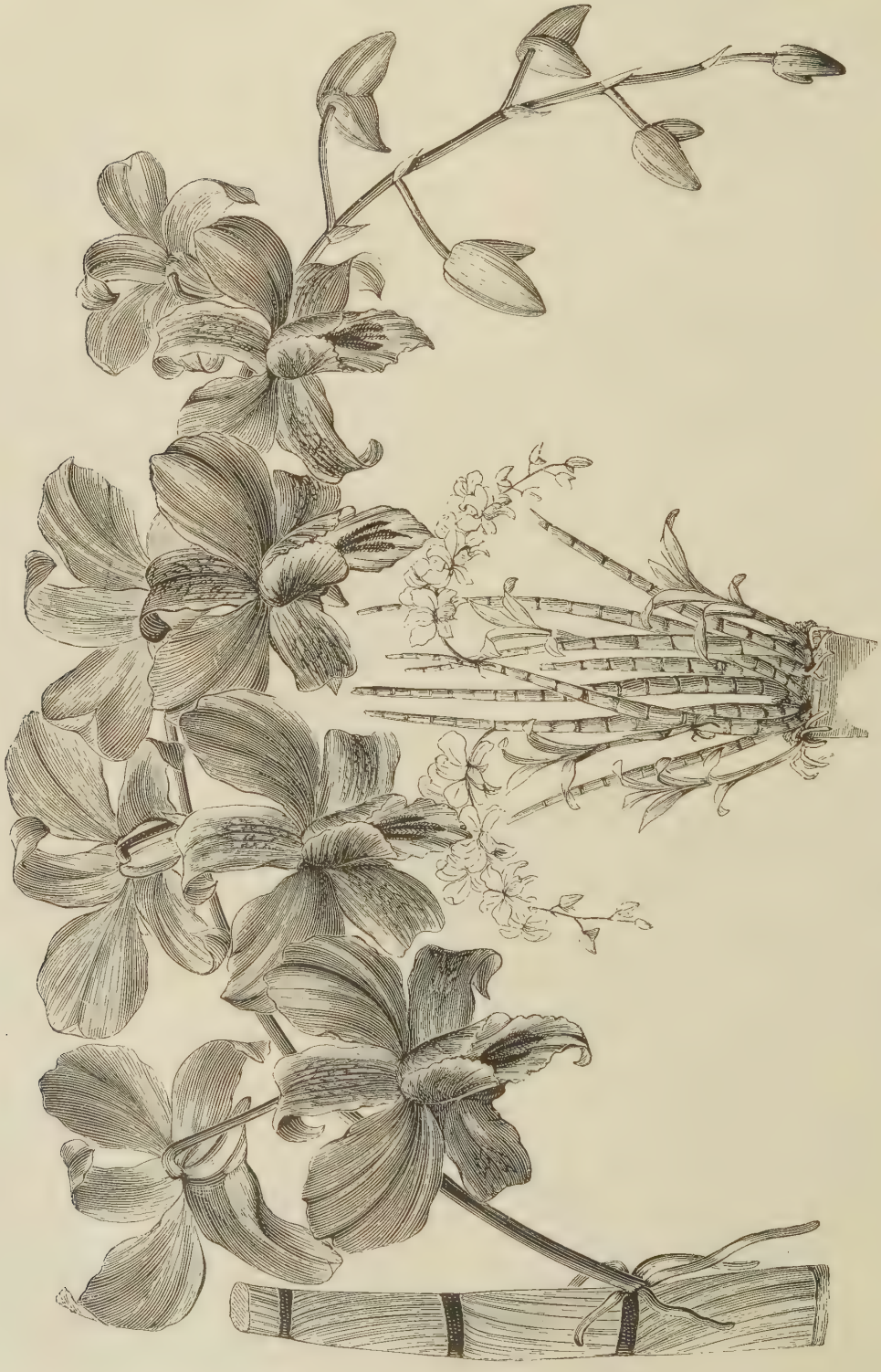


FIG. 639 DENDROBIUM SUPERBIENS, showing entire Plant and detached portion of Pseudo-bulb with Spike.

Dendrobium—*continued.*

and keep it dry, or with just sufficient moisture to preserve its pseudo-bulbs from shrivelling. It usually flowers during spring and early summer; if required to blossom in winter, it should be placed in the stove during the autumn months. This is one of the species which vary their scent at different times of the day. According to M. André, the blossoms have an odour of grass in the morning, of honey at noon, and a faint Primrose scent in the evening. There are several varieties, including the following:

D. n. intermedium (intermediate). *fl.*, sepals and petals white; lip white, with a crimson spot in the centre. A rare, but distinct and desirable form.

D. n. pendulum (pendulous). *fl.* large, richer in colour than the type; with a pendulous habit.

Other varieties are: *cærulescens*, *nobilius* (a very splendid form), and *Wallichianum*.

D. nodatum (noded). A synonym of *D. Aphrodite*.

D. ochreatum (yellowish). *fl.* produced on the young growth, about 2in. across, very thick in substance; sepals and petals bright orange; lip with a crimson blotch in the centre. Pseudo-bulbs 8in. to 10in. long, nearly 1in. in diameter. Northern India, 1837. A very handsome pendulous stove deciduous plant. SYN. *D. Cambridgeanum*. (B. M. 4450.)

D. Parishii (Parish's).* *fl.* purplish-rose, fading into white towards the centre, generally twin; lip shorter than the sepals and petals, very woolly, rose-coloured, with two eye-like purple blotches in front of the column. June. Pseudo-bulbs enveloped in a tissue-paper-like epidermis, 8in. to 14in. long, ½in. in diameter. Moulmein, 1863. A beautiful semi-erect stove deciduous species, allied to *D. nobile*, but quite distinct. (B. M. 5488.)

D. Paxtoni (Paxton's). A synonym of *D. fimbriatum oculatum*.

D. Pierardii (Pierard's).* *fl.* creamy-white or delicate pink, produced on long, beautifully festooned stems; lip Primrose-colour, with a few purple lines near the base. Winter. Pseudo-bulbs 2ft. to 4ft. long, ½in. in diameter. East Indies, 1815. A pendulous greenhouse deciduous species, best grown in a basket or on a block. (B. M. 2584.) There are several varieties, some of which are very inferior. One of the best is *D. P. latifolium*, in which the flowers are much finer than those of the type, and are rather more freely produced. It is rare. India, 1830.

D. primulinum (Primrose).* *fl.* produced in two rows along the stem; sepals and petals small, pinkish-white; lip downy, very large, shell-shaped, white, with a very faint tint of blue. February and March. Pseudo-bulbs 1ft. to 1½ft. long, ½in. in diameter. Moulmein, 1864. A rare but handsome stove deciduous species, with a pendulous habit. (B. M. 5003.)

D. pulchellum (beautiful).* *fl.* freely produced from the last matured growth; sepals and petals pinkish-white; lip rose, with an orange base; margin beautifully fringed or ciliated. March. Pseudo-bulbs branched, 6in. to 10in. long. North India. A dwarf stove deciduous species, requiring to be grown in a basket, and, when at rest, to be kept cool. See Fig. 638. (B. M. 5037.)

D. rhodocentrum (red-spurred). *fl.* light rosy, produced from the upper portions of the two-year and older pseudo-bulbs, and disposed in hanging bunches of from six to twelve; petals tipped with purple; lip white, with a purplish stain at the apex, and a yellowish base. Autumn. Pseudo-bulbs 2ft. to 3ft. long, ¼in. in diameter. 1872. A pendulous stove evergreen species.

D. rhodopterygium (rose-winged). *fl.* deep rose; lip light purple, woolly, pouched. May. Pseudo-bulbs 1ft. to 1½ft. high, ½in. in diameter. Burmah, 1875. An erect deciduous stove species, resembling *D. Parishii*, but with much larger pseudo-bulbs.

D. Ruckeri (Rucker's). *fl.* greenish-yellow, almost white externally, fragrant; lip with brown marking. Philippines, 1843. A pretty species, similar in habit to *D. aureum*.

D. sanguinolentum (blood-stained).* *fl.* produced in bunches of six or eight, from the upper parts of the old pseudo-bulbs; sepals and petals amber, veined with rose, and with purple tips; lip large, with its point heavily marked with purple. Autumn. Pseudo-bulbs 3ft. to 4ft. high, ½in. in diameter, thickly clothed with large dark green leaves. Ceylon, 1842. An erect stove evergreen species, with violet or lilac-coloured stems and leaves. (B. R. 1843, 6.) Mr. Williams mentions a variety named *superbum*, which he describes as a great improvement upon the typical form; it is much stronger in growth, with longer spikes and larger flowers. Borneo.

D. scabrilingue (rough-tongued).* *fl.* at first greenish, but soon changing to pure white, except the lip, which is shaded with green and yellow, and striped with orange; rather small, produced in pairs, and yielding a very delicious Wallflower-like perfume. Spring. Pseudo-bulbs 6in. to 10in. long, and about ¾in. in diameter. Burmah, 1862. An erect stove evergreen species. SYN. *D. hedyosmum*. (B. M. 5515.)

D. sculptum (carved). *fl.* pure white, about 2in. across, produced from the top of the matured growth, three or four on a spike; lip white, a square orange blotch on its centre. Pseudo-bulbs 1ft. to 1½ft. long, ¼in. thick. Borneo. An erect stove evergreen species.

Dendrobium—*continued.*

D. secundum (side-flowering). *fl.* purple, with a yellow lip, small, disposed in short, dense racemes, which are produced from near the top of the two-year and older pseudo-bulbs. Winter. Pseudo-bulbs 2ft. to 3ft. high, ½in. in diameter, bearing short broad leaves. Malayan Islands, 1829. Erect stove evergreen. (B. M. 4352.)

D. senile (white-haired). *fl.* bright golden-yellow, about 1in. across, in short spikes of twos or threes from the sides of the last matured growth; lip with a few reddish transverse stripes. Spring. Pseudo-bulbs 4in. to 6in. long, ½in. in diameter. Moulmein, 1865. (B. M. 5520.) A rare but pretty erect stove deciduous species, having the stems and leaves densely clothed with long white hairs. This plant should be grown upon a block of wood, and kept surrounded with a genial atmosphere; but it does not enjoy overhead syringing.

D. speciosum (showy).* *fl.* wax-like, creamy or yellowish-white, fragrant, small, but numerously disposed in a long terminal raceme (from 1ft. to 1½ft. in length), curiously resupinate or inverted, the lip appearing at the upper part of the flower; sepals and petals incurved, narrow; lip with black specks. Autumn. Pseudo-bulbs very stout, 6in. to 10in. long, 1½in. in diameter, crowned with two or three large coriaceous dark shining leaves. Eastern Australia, 1824. An erect greenhouse evergreen species, extremely easy to manage. When making its young growths, little heat is necessary; but when these are mature, it should be removed to the open air for two or three months, giving only sufficient water to keep the sun from shrivelling it up. It should be grown in a pot, and a little loam and leaf mould may be added to the compost with considerable advantage. (B. M. 3074.)

D. s. Hillii (Hill's). *fl.*, sepals and petals narrower and paler, and with longer but more slender spikes than those of the type. Pseudo-bulbs about double the length, and half the thickness, of those of *D. speciosum*. 1861. A remarkably floriferous plant. (B. M. 5261.)

D. suavissimum (very sweet-scented).* *fl.* rich yellow, about 2½in. across, with a strong Hawthorn-like fragrance, produced in erect spikes of eight to twelve, from the leafy part of one-year and older pseudo-bulbs; lip the same colour, with a conspicuous central blotch of brownish-purple; outer edge very delicately fringed. June. Burmah, 1873. Habit of growth the same as *D. chrysotoxum*. Stove. (Gn., Feb. 23, 1878.)

D. sulcatum (furrowed). *fl.* in a drooping raceme from the leafy joints; sepals and petals amber, with crimson veins; lip amber, with deep crimson markings. February. Pseudo-bulbs 6in. to 9in. high, swelling upwards, bearing two or three large leaves in the upper part. India, 1837. An erect stove evergreen species. (B. R. 1838, 65.)

D. superbiens (superb).* *fl.* usually light purple, but sometimes claret, shaded with brown, about 2in. across; spikes erect or arching, bearing from eight to twelve flowers, and produced from the upper part of the pseudo-bulbs; sepals and petals undulated or waved. Autumn. Pseudo-bulbs 1ft. to 3ft. high, 1in. in diameter. North Australia, 1876. An erect stove evergreen species. See Fig. 639. (Gn., Sept. 14, 1878.)

D. s. Goldiei (Goldie's). A very elegant form, with violet-coloured flowers. North Australia, 1878.

D. superbum (superb). *fl.* pink, tinged with rose, about 3in. or 4in. across, proceeding in a row on each side of the stems; lip rich purple. April. Pseudo-bulbs 1½ft. to 2½ft. long, ¼in. in diameter. Philippines. A pendulous stove semi-deciduous species, with flowers having a strong odour, like Turkey rhubarb; this objection will be unnoticed if the plant is grown in a basket suspended from the roof. (B. M. 3970, under the name of *D. macranthum*.)

D. s. anosmum (scentless).* *fl.* large, from 2in. to 3in. across, produced in pairs down the stem; sepals and petals rosy-pink; lip purple. Spring. Pseudo-bulbs 1ft. to 2ft. long, and about ¼in. in diameter. Manilla, 1840. A drooping stove deciduous species, best grown in a basket. Reichenbach considers this a variety of *D. superbum*, but the petals and sepals are broader, and the flowers are better-shaped and have no rhubarb scent. (P. M. B. xv. 97.)

D. s. giganteum (gigantic). *fl.* from 5in. to 7in. across; sepals and petals rose-purple; lip same colour, fringed and marked at the base with two purplish-red spots. Pseudo-bulbs much shorter and thicker than in the type. Manilla.

D. s. Huttonii (Hutton's). *fl.*, sepals and petals pure white; lip downy, brilliant purple on the inside. This splendid, but rare, variety is almost entirely without the rhubarb scent of the type. Malay Archipelago. There are two or three other varieties.

D. Tattonianum (Tatton's). A synonym of *D. canaliculatum*.

D. taurinum (bull-headed). *fl.*, sepals yellowish-green; petals deep purple, long, curling, and spread out like the horns of a bull (whence the specific name); lip white, margined with purplish-violet. Autumn. *h.* 5ft. Manilla, 1837. A strong-growing stove evergreen species, with upright stems; it is best grown in a pot. (B. R. 1843, 28.)

D. teretifolium (terete-leaved). *fl.* white, numerously produced in short bunches from the base of the pseudo-bulb; lip with black specks. October. Pseudo-bulbs small, much jointed, branching, bearing at their points a solitary terete pendulous

Dendrobium—*continued.*

leaf, which is 9in. long by ¼in. in diameter. North-east Australia, 1823. A pendulous stove evergreen species. (B. M. 4711.)

D. thyrsiflorum (thyrse-flowered). A synonym of *D. densiflorum albo-luteum.*

D. tortile (twisted). *fl.* pale yellow, almost white, suffused with purplish-rose; sepals and petals long, slightly twisted. June. Pseudo-bulbs 1ft. to 1½ft. high, ⅜in. in diameter. Moulmein, 1847. An erect stove evergreen species, flowering in the same manner as *D. nobile.* (B. M. 4477.) The variety *roseum* is extremely pretty, having flowers of a delicate rose, shaded with yellow. It resembles the type in every other respect.

D. transparens (transparent).* *fl.* transparent white, tinged with purplish-rose towards the tips, 1in. to 1¼in. across, produced in pairs along the stems; lip stained in the middle with a blotch of deep crimson encircled by a yellow zone. March. Pseudo-bulbs 1ft. to 1½ft. high. Assam, &c. An elegant, slender, erect stove deciduous plant. (B. M. 4663.)

D. triadenium (three-gland-lipped). A synonym of *D. mutabile.*

D. Wardianum (Ward's).* *fl.* about 3½in. in diameter, thirty to forty to a pseudo-bulb; sepals and petals white, upper portion bright rich magenta, broad, thick, wavy, blunt at the tips; lip large, white above, rich orange in the lower part, with two deep eye-like spots of crimson-magenta. May. Pseudo-bulbs 2ft. to 4ft. long, 1in. in diameter; nodes about 1½in. apart. Assam, 1863. A splendid stove deciduous species, requiring to be cultivated in a basket or upon a block of wood, as its stems are long and pendulous, the joints much swollen. During the growing season, it enjoys an abundant supply of water, with a good heat; but, when the growths are complete, the plant should be removed to a cooler atmosphere, and less water, as a matter of course, will suffice. The two following varieties are both rare and very desirable: *candidum* (=*album*) sepals and petals pure white; lip the same, but with an orange-coloured base. (F. M. n. s. 212.) *Lowii*, flowers white, rose, purple-brown.

D. Williamsonii (Williamson's). *fl.* ivory-white, slightly tinged with brown; lip large, with a blood-red spot. Stems erect, bearing strap-shaped leaves, clothed with short soft hairs. Assam, 1869. Stove plant, somewhat difficult to cultivate.

D. xanthophlebium (yellow-veined).* *fl.* produced in pairs upon the last matured and older pseudo-bulbs; sepals and petals white; lip medium-sized, spotted with orange; margin white. Pseudo-bulbs very small. *h.* 1ft. Moulmein, 1864. Stove.

HYBRIDS. The hybrid forms, although not numerous, are well worth cultivating. Unlike those of many other genera, they do not materially outdistance their progenitors in either form, colour, beauty, or other respect. Those mentioned below are fairly representative:

D. Ainsworthii (Ainsworth's).* *fl.* about 3in. across, with a strong, Violet-like perfume; sepals and petals white, with a slight tinge of rose; lip white, with a large central blotch of claret-colour. February and March. Pseudo-bulbs 1ft. to 2½ft. long, about ¼in. in diameter. A strong, erect, stiff-growing stove plant, the foliage of which is retained on each pseudo-bulb for two years. Obtained from *D. heterocarpum* and *D. nobile.* (G. C. n. s., viii. 166.)

D. Dominyanum (Dominy's). *fl.* rose-coloured, very pretty, produced upon two-year old bulbs. Spring. A very pretty hybrid between *D. nobile* and *D. Linawianum*, with habit and growth of the former. It is interesting from being the result of one of Mr. Dominy's first efforts in hybridising Orchids. Stove.

D. endocharis (side-flowering).* *fl.* produced from the sides of the two-year old pseudo-bulbs; sepals and petals nearly pure white; lip the same, but with brown lines. January. Pseudo-bulbs 1ft. long, ⅛in. in diameter. A very handsome stove plant, the result of a cross between *D. heterocarpum* and *D. moniliforme.*

D. Leechianum (Leech's).* *fl.*, sepals and petals white, tipped with rose-purple; lip margined with white; centre a large dark purple blotch. Hybrid between *D. aureum* and *D. nobile.* Greenhouse. (Gn., July 7, 1883.)

D. rhodostoma (red-mouthed). *fl.* three or four together in a pendulous bunch, which is produced from the upper parts of one-year and older pseudo-bulbs; sepals and petals deep rose; lip large, well expanded, rosy-purple, with deep purple markings. Autumn. Pseudo-bulbs 2ft. to 2½ft. high, ¼in. in diameter. A very handsome Veitchian hybrid between *D. Huttonii* and *D. sanguinolentum.* Stove.

D. splendidissimum (very splendid). *fl.*, sepals and petals cream-coloured, tipped with purple; lip yellowish, with a blackish-purple disk. A fine hybrid between *D. aureum*, and *D. nobile* or *D. macrophyllum.* Stove.

DENDROCHILUM (from *dendron*, a tree, and *cheilos*, a lip; in allusion to the plant having lipped flowers and growing as an epiphyte on trees). ORD. *Orchideæ.* A small genus of two or three species of stove Orchids, with long pendulous racemes of rather inconspicuous yellowish flowers, and narrow, one-leaved pseudo-bulbs. The two species which have been in cultivation are *D. aurantiacum* and *D. pallidiflavens.*

Dendrochilum—*continued.*

D. Cobbianum. *See* **Platyclinis Cobbiana.**

D. filiforme. *See* **Platyclinis filiformis.**

D. glumaceum. *See* **Platyclinis glumacea.**

DENDROCOLLA. A synonym of **Sarcochilus.**

DENDROMECON (from *dendron*, a tree, and *mekon*, a Poppy). ORD. *Papaveraceæ.* A hardy shrubby plant, thriving in a light rich loam. Increased from cuttings.

D. rigida (stiff).* Tree Poppy. *fl.* yellow; sepals two, ovate, caducous; petals four; stamens numerous. June. *l.* rigid, entire. California. The common name is very appropriate, the plant having the appearance and character of the Poppy tribe, together with a woody stem and branches. (B. M. 5134.)

DENDROPANAX (from *dendron*, a tree, and *Panax*; Tree Panax). ORD. *Araliaceæ.* Very handsome and effective stove foliage plants. There are about twenty species, natives of tropical Asia and America, as well as China and Japan; but the one given below is the only one in general cultivation. For culture, *see* **Panax.**

D. argenteus (silvery-leaved). *l.* alternate, oblong, entire, about 1ft. in length, tapering at the base, pointed or rounded at the apex; upper surface silvery-white; veins greenish; lower surface purplish; leafstalks long, stout. Stem somewhat fleshy, spotted. Brazil, 1878.

DENDROSERIS (from *dendron*, a tree, and *seris*, a kind of endive; referring to its habit and form of leaves). ORD. *Compositæ.* Handsome greenhouse trees, thriving in a rich loam. There are seven species, all natives of Juan Fernandez, but probably the only one hitherto introduced is that described below. Propagated by seeds. It is, however, usually cultivated from imported plants.

D. macrophylla (large-leaved). *fl.-heads* deep orange. Summer. Stem usually simple, surmounted by a crown of leaves and a drooping panicle of large flowers. *h.* 10ft. 1877. (B. M. 6353.)

DENHAMIA. *See* **Culcasia.**

DENTARIA (from *dens*, a tooth; referring to the fanged roots). Toothwort. ORD. *Cruciferæ.* A genus of very ornamental hardy herbaceous perennials. Radical leaves none or few, on long stalks; cauline ones stalked, placed on the middle of the stem, alternate or in whorls, palmately or pinnately cut. Stem erect, bearing the raceme at the top; pedicels filiform, bractless. Rootstocks creeping, scaly. They are of very simple culture in a rich, light soil, and a moist, shaded situation. Propagated by carefully-made divisions of the root; or by seed. There are about twenty species, all confined to North temperate regions.

D. bulbifera (bulb-bearing). *fl.* purple, few, rather large. April. *l.*, cauline ones alternate, pinnate; upper ones undivided, or with few segments, for the most part bearing bulbs in the axils. *h.* 1½ft. to 2ft. Europe (England). (Sy. En. B. 107.)

D. digitata (digitate).* *fl.* rich purple. May. *l.*, cauline ones many, alternate, stalked, palmately cut into five oblong-lanceolate, pointed, grossly serrated segments. *h.* 1½ft. South Europe, 1659. (L. B. C. 757.)

D. diphylla (two-leaved).* *fl.* white on the inside, purple on the outside. May. *l.*, cauline ones two, alternate, on short stalks, cut into three ovate-lanceolate, grossly and unequally serrate-lobed segments. *h.* 6in. to 1ft. North America, 1810. (B. M. 1465.)

D. glandulosa (glandular). *fl.* purplish. May. *l.* three in a whorl, stalked, ternate; segments oval-lanceolate, acuminated, serrated, bearing glands in the axils. *h.* 1ft. Hungary, 1815.

D. laciniata (jagged). *fl.* rose-coloured, or almost white, large. April. *l.* three in a whorl, on short stalks, three-parted; lobes or segments linear, entire, or deeply serrated or jagged. *h.* 1ft. North America, 1823.

D. pinnata (pinnate). *fl.* white, or pale purple, large. May. *l.*, cauline ones alternate, stalked, pinnate; segments oblong, acuminated, serrate-toothed. *h.* 1ft. Switzerland, &c., 1683. (R. G. 623.)

D. polyphylla (many-leaved).* *fl.* cream-coloured, large. May. *l.* three in a whorl, or alternate, stalked, pinnate; segments seven or nine, approximate, lanceolate, acuminated, serrated. *h.* 1ft. Hungary, 1817. (R. G. 171.)

D. tenella (slender). *fl.* purple, about the size of those of *Cardamine pratensis.* April. *l.* two, alternate, sessile, cut into three linear-elliptical entire segments. *h.* 9in. North America, 1826.

DENTATE. Having the margin divided into incisions resembling teeth.

DENTICULATE. Having the margins finely and slightly toothed.

DENTIDIA. A synonym of **Perilla.**

DENUDATE. A hairy or downy surface becoming naked.

DEODAR CEDAR. *See* **Cedrus Deodara.**

DEPARIA (from *depas*, a cup; referring to the form of the involucre). Including *Cionidium* and *Trichocarpa*. ORD. *Filices*. A small genus of rare stove Ferns, Involucre shallowly cup-shaped, membranaceous, not two-valved. Sori protruding from the margin of the frond. For general culture, *see* **Ferns.**

D. concinna (neat).* *fronds* bipinnate; lower pinnæ more than 1ft. long, nearly 2in. broad, deeply cut in the lower part only; lobes blunt, entire, broadly oblong-rhomboidal, unequal-sided and decurrent downwards. *sori* two to six to a lobe. Peru. SYN. *D. Matthewsii*.

D. Macræi (Macray's). A synonym of *D. prolifera*.

D. Matthewsii (Matthews'). A synonym of *D. concinna*.

D. Moorei (Moore's). *fronds* 1ft. to 1½ft. long, 6in. to 9in. broad, cordate-deltoid in general outline, pinnate below; lower pinnæ 6in. to 9in. long, 4in. to 6in. broad, cut down to the rachis into deeply-pinnatifid lobes. *sori* copious, extra marginal, or stipitate. New Caledonia.

D. nephrodioides (Nephrodium-like). *fronds* 2ft. to 3ft. long, rather firm and shining, quadripinnate; lower pinnæ stalked, under 1ft. long; pinnules deltoid, with inciso-pinnatifid lobes, 4in. long; upper ones gradually smaller, confluent and toothed only. *sori* marginal and prominent, but sessile, globose. New South Wales.

D. prolifera (proliferous).* *fronds* pinnate; lower pinnæ about 6in. long, 1in. to 1½in. broad, pinnatifid; lobes oblong, slightly toothed. *sori* four to twelve to a lobe, extra marginal, sessile or stipitate. Sandwich Islands. SYN. *D. Macræi*.

DEPAUPERATED. Imperfectly developed.

DEPENDENT. Hanging down.

DEPPEA (named in honour of M. Deppe, who collected and sent home many plants from Mexico). SYN. *Choristes*. ORD. *Rubiaceæ*. A genus containing about twelve species of shrubs, all natives of Mexico. Flowers yellow, small, arranged in cymes; corolla rotate, or shortly funnel-shaped. Leaves, opposite, petiolate, membranous, ovate or lanceolate. *D. erythrorhiza* is a shrubby greenhouse plant, with a woody root and reddish inner bark. For culture, *see* **Bouvardia.**

D. erythrorhiza (red-rooted).* *fl.* yellow; cymes terminal and axillary, pedunculate, of three or four branches. *l.* petiolate, elliptic, acuminated at both ends, rather pilose above and on the margins; stipules triangular, deciduous. *h.* 1ft. to 3ft.

DEPRESSARIA CICUTELLA. *See* **Flat-body Moth.**

DEPRESSARIA DAUCELLA. *See* **Carrot Blossom Moth.**

DEPRESSARIA DEPRESSELLA. *See* **Purple Carrot-seed Moth.**

DEPRESSED. Pressed down; having the appearance of being pressed.

DESCANTARIA. Included under **Tradescantia.**

FIG. 640. LEAF OF DESFONTAINEA SPINOSA.

DESFONTAINEA (named after R. L. Desfontaines, a celebrated French botanist, born 1752, died 1833). ORD. *Loganiaceæ*. A very beautiful, hardy, evergreen shrub, of easy cultivation. It thrives in either a peat or loam soil, but preferably the latter. Cuttings will root if inserted in either of the soils above named, with the addition of a little sand; a gentle heat would accelerate the rooting. It forms an admirable plant for greenhouse or conservatory decoration, and even when out of flower its peculiar Holly-like appearance is most attractive.

D. spinosa (spinose). *fl.* showy, terminal, solitary, pedunculate; corolla scarlet, with a yellow limb, tubular. August. *l.* elliptic-oblong, coriaceous, glabrous, shining above, cuneated, and quite entire at the base, with spiny-toothed margins. *h.* 3ft. Andes from Chili to New Grenada, 1853. See Fig. 640. (B. M. 4781.)

DESIGNS. The art of taking plans or Designs of objects should, according to Loudon, be considered as part of a gardener's general education, since none who aspire to any degree of eminence in their profession, ought to be ignorant of the first principles of geometry and drawing. A Design of the whole or any part of a garden, as, for instance, a flower-bed, intended as a working plan, should, above all things, be accurately drawn. It is impossible to correctly transfer an intricate Design from paper to show itself in a given space on the ground, unless the boundary of that space has been previously measured, and it, with all the arrangements of the enclosure, carefully prepared on an equal scale throughout. In the case of a garden, the full size being known, and the scale determined (as large a one as practicable being preferred), the positions of any permanent features of the inside, such as large trees, glass structures, &c., either those already existing, or others contemplated, should be marked, and the scale attached to the Design for reference. A plan of a flower-garden or carpet-bed should have the same rule of drawing to scale measurement applied, as the position and space to be occupied by different plants can be previously arranged, and the proportion of colours properly inserted. A glance at this, when bedding time comes, will at once indicate the positions assigned to all the plants, and so prevent much confusion that would otherwise prevail. Intricate carpet-bedding Designs are often worked out by marking the lines with white sand; others may be shown with stakes or small pegs. Designs for glass structures vary according to the requirements of the plants for which they are intended; but each should show, in the same proportion, all the working details it is proposed to introduce.

DESMANTHUS (from *desme*, a bundle, and *anthos*, a flower; the flowers are collected into bundles or spikes). ORD. *Leguminosæ*. A genus of stove perennial suffruticose herbs or shrubs, all the species of which belong to the New World, except one, which occurs everywhere in tropical regions. Flowers all hermaphrodite; calyx campanulate, shortly dentate; petals free, or slightly cohering, valvate. Leaves bipinnate; leaflets small; stipules setaceous, persistent. There are about eight species, one or two of which have been successfully cultivated in this country. In their native habitats, all are more or less ornamental.

DESMOCHÆTA. Included under **Pupalia** (which *see*).

DESMODIUM (from *desmos*, a band; in reference to the stamens being connected). ORD. *Leguminosæ*. A genus containing about 125 species of suffruticose herbs or sub-shrubs, found in all warm parts of the globe. The genera *Catenaria*, *Dendrolobium*, *Dicerma*, *Dollinera*, *Heteroloma*, *Phyllodium*, and *Pteroloma*, are included by Bentham and Hooker under *Desmodium*. Flowers purple, blue, rose, or white, in usually loose terminal racemes. Leaves pinnately-trifoliolate; stipels two at the base of the terminal leaflet, and one at the base of each lateral leaflet. Stove and greenhouse plants, except where otherwise stated. For culture, *see* **Cnestis.**

D. alatum (winged). A synonym of *D. triquetrum*.

D. biarticulatum (two-jointed). *fl.* yellow, disposed in an almost naked terminal raceme. July. *l.* trifoliolate; leaflets about equal

Desmodium—*continued.*

in size, rising from the top of the petiole, obovate-oblong, obtuse. *h.* 2ft. East Indies, 1808.

D. canadense (Canadian).* *fl.* reddish-purple, in simple or panicled, lateral or terminal racemes. July. *l.* pinnately-trifoliolate; leaflets oblong-lanceolate, smoothish. Stems erect, rather pilose and striated. *h.* 4ft. to 6ft. North America, 1640. Hardy. (B. M. 3553.)

D. gyrans (moving).* Moving or Telegraph Plant. *fl.* violet; racemes numerous, disposed in a panicle. July. *l.* pinnately-trifoliolate; leaflets elliptic-oblong, terminal one very large, and lateral ones very small. *h.* 1ft. to 3ft. East Indies, 1775. A very singular annual, the lateral leaflets moving up and down, either steadily or by jerks, the movements being most marked during bright sunshine.

D. nutans (nodding). *fl.* bluish-lilac, twin; racemes compound, terminal and axillary, and, as well as the branches, pendulous. July. *l.* pendulous, pinnately-trifoliolate; leaflets roundish-rhomboid, tomentose on both surfaces. *h.* 1ft. to 3ft. East Indies, 1823. (B. M. 2867.)

D. penduliflorum. A synonym of *Lespedeza bicolor.*

D. podocarpum (foot-fruited). *fl.* purple; racemes terminal, elongated, slender. July. *l.* pinnately-trifoliolate; leaflets broad-ovate, rather rhomboid, pale beneath. Stem ascending, terete. *h.* 1ft. to 2ft. Nepaul.

D. pulchellum (pretty). *fl.* purple, two to each pair of floral leaves, which are bifoliate. July. *l.* pinnately-trifoliate; leaflets elliptic-oblong, pubescent beneath. *h.* 2ft. to 3ft. East Indies, 1798.

D. Skinneri albo-nitens (Skinner's shining white).* A variety having purple flowers and leaves lined with white. It is a pretty climber, and is very effective trained along the rafters of the stove. SYN. *Rhynchosia albo-nitens.* (B. M. 5452.)

D. triquetrum (triquetrous). *fl.* purple. July. *l.*, leaflets lanceolate, acuminated, eight times longer than the petioles. *h.* 3ft. to 6ft. East Indies, 1817. SYN. *D. alatum.*

DESMONCUS (from *desmos*, a band, and *ogkos*, a hook; the ribs of the leaves ending in recurved hook-like points). ORD. *Palmæ.* Very ornamental stove Palms. Flowers appearing in the axils of the leaves, on a branched spike. Leaves pinnate, prickly. Stem long, slender, ascending. The few species in cultivation, when in a young state, make rather handsome plants for table decoration; when too large for this purpose, a pillar or rafter of the stove should be devoted to them, where their peculiar leaves will be displayed to advantage, and in such a position afford a pleasing shade. For culture, *see* **Calamus.**

D. granatensis (New Grenadan).* *l.*, petioles terete and spineless, except at the top, where they bear a few setæ, and where are also seated a pair of lanceolate divergent pinnæ, nearly 2in. broad, and of a lively green colour. Columbia, 1875.

D. major (greater). *l.*, segments about twenty pairs, linear, acuminate; rachis prickly, covered with a blackish, deciduous tomentum; spathe covered with brown prickles. Stem reed-like, climbing, prickly. Trinidad.

D. minor (less)* may be likened to a miniature *D. major.* All its parts are considerably smaller. West Indies.

DEUTZIA (named in honour of Johann Deutz, Dutch naturalist, a friend and patron of Thunberg's). ORD. *Saxifrageæ.* Very ornamental, pubescent or scabrous, hardy deciduous shrubs. Flowers white, axillary, or disposed in axillary and terminal corymbs. Leaves opposite, petiolate, ovate, acuminated, serrated, wrinkled and veined, scabrous from stellate hairs. Branches purplish and villous. Some of the Deutzias are amongst the hardiest of dwarf white-flowering shrubs; and, as they are also well adapted for growing in a cool-house, or for forcing, they are extremely useful. If cultivated in a temperature from 45deg. to 50deg., they develop both foliage and flowers, in which condition they are, of course, far preferable. A compost of loam, enriched with thoroughly decayed cow manure, with the addition of coarse sand, suits them well. The plants will require repotting every year, after flowering, and then plunging in a bed of coal ashes. Attention must be paid to thinning the shoots, in such a manner that an equal growth is maintained throughout the plant, so that it shall have a somewhat globular form. *D. gracilis* is the species most grown for forcing, for which purpose it can hardly be superseded; it forms a beautiful plant when so treated. Deutzias will not succeed if forced two years in succession, but will do so when only gradually brought on earlier in the spring. It is a good plan to

Deutzia—*continued.*

place them in the open ground, in summer, and have two batches of plants, so that one may be forced while the other is left in the open ground, to succeed it the following year. Deutzias lift well in autumn, and should be potted and placed in cold frames, in October, to be gradually brought on as required. The stronger-growing sorts succeed in almost any soil or position in the shrubbery border.

D. corymbosa (corymbose).* *fl.* white; panicles corymbose, trichotomous; panicle and outside of calyx dotted. *l.* oblong or elliptic lanceolate. *h.* 5ft. Himalayas.

FIG. 641. FLOWERING BRANCH AND SINGLE FLOWER OF DEUTZIA CRENATA FLORE-PLENO.

D. crenata (crenate).* *fl.* white, racemose or paniculate. *l.* ovate-lanceolate, rigidly serrulate, rough to the touch. Stems slender. *h.* 4ft. to 8ft. Japan. A very handsome shrub. SYNS. *D. Fortunei* and *D. scabra*, of gardens. (B. R. 1718, under the name of *D. scabra.*) The varieties *flore-pleno* (see Fig. 641) and *purpurea-plena* have double-white and pink-tinted flowers respectively.

FIG. 642. FLOWERING SPRAY OF DEUTZIA GRACILIS.

D. Fortunei (Fortune's). A synonym of *D. crenata.*

D. gracilis (slender).* *fl.* white, numerously disposed in terminal racemes. April. *l.* small, ovate, acuminate, serrated. *h.* 1ft. to 2ft. Japan. See Fig. 642.

D. scabra (rough). A synonym of *D. crenata.*

D. staminea (conspicuous-stamened).* *fl.* white, sweet-scented; petals oblong, induplicate-valvate; corymbs many-flowered; calyx tube hoary-tomentose with stellate hairs; teeth short, triangular. May and June. *l.* 1in. to 2in. long, oblong, or elliptic-lanceolate, grey tomentose beneath with stellate hairs. *h.* 3ft. Himalayas, 1841. Deciduous. (B. R. 1847, 13.)

DEVIL-IN-THE-BUSH. *See* **Nigella.**

DEVIL'S APPLES. *See* **Mandragora officinalis.**

DEVIL'S BIT. *See* **Scabiosa Succisa.**

DEVIL'S COACH HORSE. *See* **Beetles.**

DEVIL'S FIG. *See* **Argemone mexicana.**

DEVIL'S LEAF. *See* **Urtica urentissima.**

DEWBERRY. *See* **Rubus fruticosa cæsius.**

DIACALPE (from *dia*, through, and *calpis*, an urn; referring to the disposition of the spore-cases). ORD. *Filices*. A monotypic genus. Involucre inferior, globose, hard-membranous, entire, at length bursting very irregularly at the summit. Capsules numerous, nearly sessile. Sori globose; the receptacle small, scarcely elevated. For culture, *see* **Ferns.**

D. aspidioides (Aspidium-like). *fronds* tripinnate, sub-membranaceous, often deciduously crinite; pinnules oblong-cuneate, lobed, more or less decurrent. Malay Islands, &c. Stove.

DIADELPHOUS. Applied to the stamens when they are connected into two bundles.

DIANDROUS. Having two stamens.

DIANELLA (a diminutive of *Diana*, the sylvan goddess; in reference to the plants growing in woods). SYN. *Rhuacophila*. ORD. *Liliaceæ*. Very ornamental fibrous-rooted half-hardy perennials. Flowers paniculate, on drooping pedicels; perianth six-cleft. Leaves grass-like. The species thrive, in sheltered spots in the southern counties, in a mixture of loam and peat. All succeed well planted out in the cool conservatory. Increased readily by divisions; or by seeds, sown in gentle heat, in spring.

D. cærulea (sky-blue). *fl.* blue; branches of panicle short. May. *l.*, stem ones long, numerous, ensiform, rough at the edge and keel. *h.* 2ft. New South Wales. (B. M. 505.)

D. intermedia (intermediate). *fl.* whitish, numerous, disposed in much-branched panicles 10in. to 18in. long. *l.* linear, ensiform. New Zealand. A free-growing species, producing bunches of pretty dark blue berries.

D. lævis (smooth).* *fl.* bluish, in loose racemes; pedicels filiform, solitary, upright, distant, erecto-patent, scattered; corolla reflexed, inner segments ruled down the middle with three deeply-coloured lines, parallel with the axis of the segment; outer with five similar ones; filaments bent at the top, and connected by a joint with a short, thick, orange-coloured, irregularly oblong strumous body, on the inwardly shelving summit of which the anther is fixed by its base. Spring. *l.* bright green, ensiform, broad, smooth, and keeled. *h.* 2ft. New South Wales, 1822. SYN. *D. strumosa*. (B. R. 751.)

D. strumosa (measly). A synonym of *D. lævis*.

D. tasmanica (Tasmanian).* *fl.* pale blue, drooping, ¼in. to ⅜in. in diameter; panicles large, loose, decompoundly branched, very many-flowered; perianth segments oblong, reflexed. Berries deep blue, ¼in. to ⅜in. long, broadly oblong. *l.* 3ft. to 4ft. long, broadly ensiform, with revolute margins, armed with spinular teeth. Tasmania, 1866. A very ornamental, large, rigid, grassy-leaved plant, sometimes attaining a height of 5ft. It forms a conspicuous ornament for the conservatory, its chief beauty consisting in the abundance of bright blue berries, which hang for many weeks on the hair-like pedicels. (B. M. 5551.)

DIANTHERA (from *dis*, two, and *anthera*, anther; the cells are more or less separated from one another). SYN. *Rhytiglossa*. Including *Porphyrocoma*. ORD. *Acanthaceæ*. A rather large genus of erect, ascendent, diffuse, or prostrate, stove, greenhouse, or hardy herbs. Flowers long, solitary or fascicled, bracteate; corolla with a narrow tube, which is either straight or incurved. Leaves entire, or rarely dentate. For culture, *see* **Justicia.**

D. americana (American). *fl.*, corolla pale violet, or whitish, less than ¼in. long; base of lower lip rugose; peduncles mostly exceeding the leaves, capitately several-flowered. Summer. *l.* narrowly lanceolate, 3in. to 4in. long, tapering at base, subsessile. Stem sulcate-angled. *h.* 1ft. to 3ft. In water, Canada to South Carolina, Arkansas, and Texas. Hardy aquatic. SYN. *Justicia pedunculosa* (under which name it is figured in B. M. 2367).

D. ciliata (fringed).* *fl.* violet, with a white palate, numerous, fascicled. Winter. *l.* ovate-lanceolate, 2in. to 3in. long. *h.* 2ft. Venezuela, 1870. A pretty stove sub-shrub. SYN. *Beloperone ciliata*. (B. M. 5888.)

D. Pohliana (Pohl's).* *fl.* purple; bracts deep red, imbricated, rather large; spike terminating the branches, closely packed, cone-like. March. *l.* somewhat large, sessile, narrowed to both ends. Brazil, 1880. Stove. SYN. *Porphyrocoma lanceolata*. (B. M. 4176.)

D. secunda (side-flowering). *fl.* red, in compound terminal racemes; bracts setaceous. October to February. *l.* ovate-lanceolate, acuminate. Branches secund, many-flowered. West Indies, 1793. Stove. SYN. *Justicia secunda* (under which name it is figured in B. M. 2060).

DIANTHUS (from *dios*, divine, and *anthos*, a flower; the name given by Theophrastus, in allusion to the exquisite

Dianthus—*continued.*

fragrance of the blossoms of most of the species, as well as from their unrivalled neatness and brilliancy). Pink. ORD. *Caryophylleæ*. Tufted, mostly glaucous herbs, often shrubby at the base. Flowers rose or purple, rarely white or yellow, terminal, solitary, panicled or fascicled; calyx tubular, five-toothed, furnished at the base with imbricating bracts (see Fig. 643); petals five, entire or cut, with long claws. Leaves narrow, grass-like. This genus consists of about seventy species, according to the authors of the "Genera Plantarum," although more than four times that number have been accorded specific rank by various botanists. Just a hundred are regarded as species by Nyman, in his enumeration of European plants. The list given below includes only such as are known to be in cultivation. In most cases, the specific distinctions are very trivial, and this fact has also necessitated several omissions. Hardy perennials, except where otherwise specified. For culture, *see* **Carnation** and **Pink.**

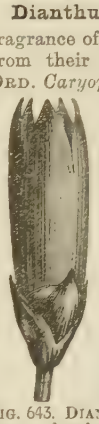


FIG. 643. DIANTHUS, showing Five-toothed Calyx and Bracts at Base.

D. aggregatus (aggregate). *fl.* pink, large, aggregate, sessile. June, July. *l.* lanceolate, many-nerved. *h.* 1ft. 1817. Biennial. (S. F. G. ii. 166.)

D. alpestris (rock).* *fl.* red, usually in pairs; petals emarginate. July. *l.* linear-lanceolate. *h.* 6in. to 9in. Alpine pastures of Europe, 1817.

FIG. 644. FLOWERS OF DIANTHUS BARBATUS.

D. alpinus (alpine).* *fl.* deep rose, spotted with crimson, very numerously produced, large; petals crenated. June. *l.* oblong-linear, obtuse, green. Stem leafy, one-flowered. *h.* 3in. to 4in. Alps of Austria, &c., 1759. (Gn., Aug. 30, 1884.)

D. arbusculus (little-tree).* *fl.* rich purple-crimson, panicled, aggregate, solitary, single or double; inner petals spotted at the base; petals toothed. July. *l.* lanceolate, and, as well as the shrubby stem, glabrous. *h.* 1½ft. China, 1824. Greenhouse or half-hardy evergreen. (B. R. 1086.)

Dianthus—*continued.*

D. arenarius (sand-loving).* *fl.*, petals divided beyond the middle into very narrow lobes, furnished with a livid spot and pressed purple hairs at the base of each, the rest white. Summer. Stems generally one-flowered. North and Eastern Europe. (B. M. 2038.)

FIG. 645. FLOWERING BRANCH AND SINGLE FLOWER OF DIANTHUS SUPERBUS.

D. atrorubens (dark-red).* *fl.* dark red, small, sessile, in aggregate heads; involucre ovate, awned, shorter than the heads of flowers. Summer. *l.* linear, three-nerved. *h.* 1ft. South and Eastern Europe, 1802. (B. M. 1775.)

D. Balbisii. A synonym of *D. liburnicus.*

D. barbatus (bearded).* Sweet William. *fl.* very variable in colour, aggregate, in bundles; petals bearded. Summer. *l.* lanceolate, nerved. South and Eastern Europe, 1573. See Fig. 644. Of this splendid old-fashioned plant, varieties are innumerable, and far exceed the type in point of beauty.

D. bicolor (two-coloured). *fl.* white above and lead-coloured beneath, solitary; petals dilated. Summer. *l.* awl-shaped; lower ones tomentose. Stem panicled. *h.* 1ft. to 2ft. Southern Russia, 1816.

D. cæsius (bluish-grey).* Cheddar Pink. *fl.* of a delicate rose-colour, very fragrant; petals crenated, pubescent. Summer. *l.* short, with scabrous margins. Stem tufted, generally one-flowered. *h.* 3in. to 6in. Europe (Britain). Plant very glaucous. (Sy. En. B. 193.)

D. Caryophyllus. Carnation; Clove Pink. *fl.* solitary, nearly every colour except blue; petals very broad, beardless. Summer. *l.* linear-awl-shaped, channelled, glaucous. Stem branched. South Europe. Naturalised here and there in England. There are numerous varieties of this species. *See* **Carnation.**

D. chinensis (Chinese).* Chinese or Indian Pink. *fl.* very variable in colour, but usually reddish, and are either single or double; solitary or somewhat aggregate; petals toothed. Summer. *l.* lanceolate, pale green. Stem branched. *h.* 6in. to 12in. China, 1713. Biennial.

D. c. Atkinsoni (Atkinson's)* is a beautiful garden hybrid, of which, in all probability, *D. chinensis* is one of the parents. It has deep blood-red flowers, and is one of the handsomest of old-fashioned garden Pinks. It seems difficult to increase by division or cuttings, and does not ripen seed. (Gn., Jan. 12, 1884.)

D. cruentus (bloody).* *fl.* bloody-scarlet, small, numerous; cymes contracted, somewhat globose; petals toothed, bearded towards the base with scattered reddish-violet hairs; calyx reddish-violet. Summer. *l.* linear-lanceolate, very acute; lower ones tufted. Eastern Europe. (R. G. 26.)

D. deltoides (deltoid). Maiden Pink. *fl.* rose-coloured, with a dark circle, solitary. Summer. *l.*, upper ones narrow, acute,

Dianthus—*continued.*

pubescent; lower ones oblong, obtuse. Stems ascending, branched. *h.* 6in. to 9in. Europe (Britain). (Sy. En. B. 192.)

D. dentosus (toothed). Amoor Pink. *fl.* violet-lilac, with a regular dark spot, formed of purple streaks, at the base of each petal, producing a dark eye in the centre of the flower, more than 1in. across; petals toothed at the margin, bearded at the base. Summer. *l.* linear, rather broad, sometimes slightly undulated, glaucous, tinged with a reddish hue. *h.* 6in. Southern Russia.

D. fimbriatus (fimbriate).* *fl.* rose-coloured, solitary; petals oblong, multifidly toothed, beardless. Summer. *l.* awl-shaped, scabrous. Stem suffruticose at the base, branched. *h.* 1ft. Iberia, 1815. (B. M. 1069, under name of *D. orientalis*).

D. Fischeri (Fischer's).* *fl.* rose-coloured, somewhat aggregate; petals multifid, almost beardless; fascicles closely-set, many-flowered. Summer. *l.* lanceolate, serrulated. Stem panicled. Russia, 1820. (S. B. F. G. 245.)

D. fragrans (fragrant).* *fl.* white, suffused with purple, fragrant; petals semi-multifid, beardless. July to September. *l.* awl-shaped, with roughish margins. Stems generally one-flowered. *h.* 6in. to 9in. Caucasus, 1804. (B. M. 2067.)

D. fruticosus (shrubby). Shrubby Pink. *fl.* dark in the middle, rose-coloured in the circumference, and white and pilose at the base, aggregate. Summer. *l.* obovate, lanceolate, obtuse. Stem shrubby. Half-hardy evergreen. *h.* 1ft. to 2ft. Grecian Archipelago (Island of Serfo), 1815. (S. F. G. 407.)

D. gallicus (Gallic). *fl.* white, livid at the base; petals dentately-multifid. July, August. *l.* linear, somewhat ciliated. Stems ascending, generally one-flowered. *h.* 6in. Western France, Northern Spain, and Portugal.

D. giganteus (gigantic). *fl.* purple, numerous, sessile, disposed in hemispherical heads, supported at the base by leafy bracts. Summer. *l.* linear, very long, connate at the base a long way. Stem round. *h.* 2ft. to 4ft. Eastern Europe, 1828.

D. glacialis (icy).* *fl.* reddish-purple, small, scentless; petals serrated. Summer. *l.* linear, acute, serrulated, green. Stems erect, tufted, short, generally one-flowered. *h.* 3in. Mountains of Central Europe, 1820. (F. M. n. s. 268.)

FIG. 646. FLOWER OF DIANTHUS SUPERBUS GARDNERI (CUT-FLOWERED CHINESE PINK).

Dianthus—*continued.*

D. Holtzeri (Holtzer's).* *fl.* pink, about 1½in. in diameter; petals more or less fringed. *l.* linear-lanceolate. Turkestan. (R. G. 1032, 1.)

FIG. 647. FLOWERS OF DOUBLE VARIETY OF DIANTHUS CARYOPHYLLUS (CARNATION).

D. latifolius (broad-leaved). *fl.* pink, aggregate, racemosely corymbose. Summer. *l.* oblong-lanceolate. *h.* 1½ft. The habit of this plant is very like that of *D. barbatus*, but the leaves are broader, and the flowers double the size. Native country unknown. (S. B. F. G. 2.)

D. liburnicus (Liburnian). *fl.* red, almost sessile, in capitate bundles. August. *l.* lanceolate-linear. Stem angular. *h.* 1ft. to 2ft. South and Eastern Europe, 1817. Plant glaucous. SYN. *D. Balbisii.*

D. monspessulanus (Montpelier).* *fl.* red, solitary; petals digitately multifid, smooth in the throat. Summer. *l.* linear, serrulated. Stem panicled, few-flowered. *h.* 6in. to 12in. South and Eastern Europe, 1764.

D. neglectus (neglected).* *fl.* deep rose; petals serrated. Summer. *l.* green, linear, acute, serrulated. Stems erect, tufted, short, generally one-flowered. *h.* 2in. to 4in. South-west Europe, 1869.

FIG. 648. DIANTHUS CHINENSIS FLORE-PLENO.

D. pallidiflorus (pale-flowered). *fl.* purplish-rose, very numerous, solitary. Late summer. *l.* linear, pointed, flat, sessile. *h.* 6in., forming dense and branching tufts. Russia.

Dianthus—*continued.*

D. petræus (rock).* Rock Pink. *fl.* rose, usually solitary on the freely-produced stems; petals beardless, multifid. Summer. *l.* awl-shaped, entire, glabrous. *h.* 6in. Eastern Europe, 1804.

D. plumarius (feathered).* Garden Pink; Pheasant's Eye. *fl.* white, purple, either double or single, spotted or variegated, and more or less fringed on the margins, sweet-scented; petals jagged, multifid, bearded. Summer. *l.* linear, with scabrous margins. Stems two or three-flowered. *h.* 9in. to 12in. Eastern Europe, 1629. Plant glaucous. (Sy. En. B. 195.)

FIG. 649. FLOWER OF DIANTHUS CHINENSIS HEDDEWIGII FLORE-PLENO.

D. Seguierii (Seguier's).* *fl.* rosy-purple. Summer. *h.* 1ft. South and Eastern Europe, Asia, 1832.

D. squarrosus (spreading). *fl.* like those of *D. plumarius*, but with a longer calyx; petals white, finely jagged. Summer. *l.* awl-shaped, channelled, stiff, short, recurved. Stems generally one-flowered. *h.* 6in. Southern Russia, 1817.

D. suavis (sweet). *fl.* pink, sweet-scented; petals bearded, doubly and deeply serrated. Summer. *l.* linear, spreading, glaucous. Stems generally one-flowered. *h.* 6in. Native country unknown.

FIG. 650. FLOWER OF DIANTHUS CHINENSIS PLENISSIMUS.

D. superbus (superb).* *fl.* rose-coloured, very fragrant, particularly at night, somewhat fastigiate; petals divided beyond the middle, feathery, bearded at the base. Summer. *l.* linear-lanceolate, bright green, acute, entire. Stems smooth, panicled, many-flowered. *h.* 9in. to 18in. Europe and Asia, 1596. See Fig. 645. (B. M. 297.)

D. s. Gardneri (Gardner's), is a fine variety, with very large laciniated flowers. China. See Fig. 646.

Dianthus—*continued.*

D. virgineus (virgin). *fl.* red; petals crenated. Summer. *l.* tufted, linear, stiff, serrulate. Stems generally one or few-flowered. *h.* 6in. to 12in. South-western Europe, 1816. (B. M. 1740.)

VARIETIES. Innumerable varieties are in cultivation of three species belonging to this genus, namely, *D. barbatus* (the Sweet William), *D. Caryophyllus* (the Carnation and Clove Pink, see Fig. 647), and *D. chinensis* (the Chinese or Indian Pink), a double form of which is shown in Fig. 648. In garden literature, the generic name is generally only applied to the last of these three, the others being well-known under their popular garden names. Although a biennial, *D. chinensis* may be successfully grown as an annual, by sowing in pots or in the open ground, in March. There are double and single forms, in a great variety of colours, the flowers of the former being best adapted for cutting; while the latter are the most showy. *D. c. Heddewigii*, and the numerous seedlings obtained from it, represent an exceedingly useful class of dwarf plants for mixed borders, or for pot culture, many of the flowers being beautifully marked and fringed. Its double form (see Fig. 649) is not so floriferous, but is distinct and useful for cutting. *D. c. plenissimus* (see Fig. 650) is a variety with very full double flowers, beautifully fringed.

DIAPENSIA (meaning obscure). ORD. *Diapensiaceæ*. A genus of two species of small, tufted herbs. Flowers white or purplish-rose, solitary, erect, pedunculate; corolla salver-shaped; tube short, wide; limb flat. Peduncles scape-formed, one-flowered. Both these little gems are usually considered difficult to cultivate; but they have been found to succeed on fully exposed rockwork, in deep sandy peat, kept well moistened during the warm season. Increased by division.

D. barbulata. *See* **Pyxidanthera barbulata.**

FIG. 651. DIAPENSIA LAPPONICA.

D. lapponica (Lapland).* *fl.* pure white; peduncles usually one-flowered, erect. July. *l.* linear-spathulate, coriaceous, with callous, sub-revolute edges. *h.* 1in. to 2in. Norway, Lapland, Arctic America, &c. See Fig. 651. (B. M. 1108.)

DIAPENSIACEÆ. A small order of prostrate sub-shrubs, principally inhabiting the colder parts of Europe and North America. Calyx persistent, five-parted; segments imbricated; stamens five, free, adnate to, or alternating with, the segments of the corolla. Leaves sometimes small, numerous, sessile, imbricated, narrow, and entire; sometimes large, orbiculate, dentate. The order includes the genera *Diapensia*, *Galax*, *Pyxidanthera*, and *Shortia*, as well as two others which have not yet found their way into cultivation.

DIAPHANOUS. Transparent.

DIASCIA (from *diaskeo*, to adorn; in reference to the pretty flowers). ORD. *Scrophularineæ*. Very pretty greenhouse annual herbs. In this genus, there are about a score species, all natives of South Africa. Seeds may be sown in a gentle heat, early in spring, and the seedlings transferred, like Lobelias and other bedding plants, to the open, about June.

D. Barberæ (Mrs. Barber's). *fl.* rosy-pink, double-spurred, disposed in terminal racemes. July. *l.* ovate, bluntly serrate. *h.* 1ft. 1871. (B. M. 5933.)

DIASTEMANTHE. A synonym of **Stenotaphrum.**

DIBBER, or **DIBBLE.** A useful instrument in gardens, often made from a hard piece of wood, such as an old spade handle, and principally employed for planting out seedlings, of small or medium size. Dibbers, when used on a large scale, are usually cased with a hollowed, tapering point of steel. In heavy soils, the sides of the hole are liable to become polished with the steel sheath, and the roots do not then penetrate them freely. Light soils give when the Dibber is inserted,

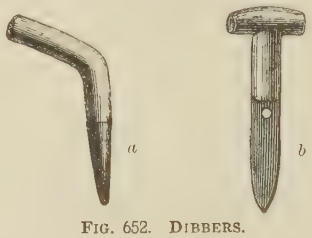


FIG. 652. DIBBERS.

consequently they are best suited for its use. Fig. 652 represents two forms of steel-cased Dibbers in general use. One (*a*) is made from a piece of wood of the shape represented, and is preferred by some to the other (*b*), which may be prepared from a spade handle.

DIBBLEMMA. *See* **Polypodium.**

DIBBLING. The process of planting with a Dibber. Its chief advantages lie in economising the plants, and rendering thinning almost unnecessary. Seedlings growing closely together should be dibbled out temporarily, until sufficiently strong for placing in permanent quarters by the same method. Dibbling has some disadvantages, the roots often being placed straight down instead of in the natural way in which they grow. It is, however, an expeditious mode, much practised with fast-growing

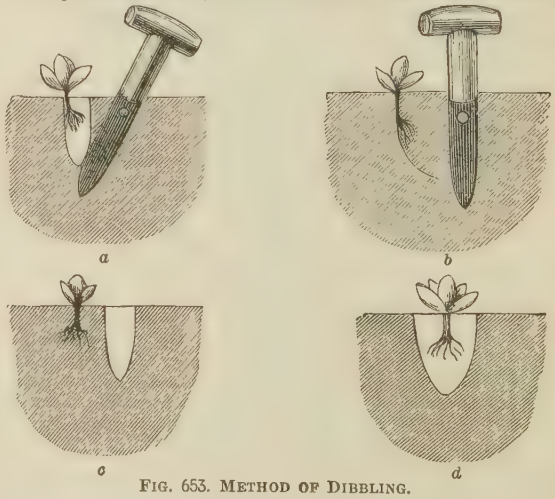


FIG. 653. METHOD OF DIBBLING.

plants that soon form new roots. The process is shown in the accompanying engravings (see Fig. 653), where *a*

Dibbling—*continued.*

represents the position of the Dibber for pressing the soil against the roots; *b*, its position when this is completed; and *c*, the Dibber removed, leaving the hole for watering. The next illustration (*d*) shows a more careful way of planting, on a small scale, by making a hole with a Dibber, afterwards arranging the roots and filling in by hand. A long Dibber is often used for planting Potatoes; it is large enough to make a hole for the set to drop in, and has a cross handle, for the use of both hands, and a projecting piece of iron or wood which serves the double purpose of forming a tread and insuring an equal depth to all the holes made. For inserting cuttings or young plants, small tapering pieces of wood are employed.

DICENTRA (from *dis*, twice, and *kentron*, a spur; in allusion to the double-spurred flowers). SYNS. *Capnorchis* and *Diclytra* (often written *Dielytra*). ORD. *Fumariaceæ*. Very ornamental hardy herbaceous perennials, with tuberous, horizontal, or fibrous roots. Flowers pink or yellow, in terminal racemes; petals four, the two exterior ones equally spurred or gibbous at the base. Leaves stalked, multifid. They are all of easy culture in moderately rich, light soil. Increased readily by dividing the crowns, in early spring; or by cutting the fleshy roots in short lengths, and inserting them in sandy soil. *D. spectabilis* is very beautiful when forced in early spring, but the forcing must be very gentle, and the plants kept as near the glass as possible. A moist temperature of 50deg. to 55deg. will be sufficient. As a rule, it is much preferable to have fresh plants every year, returning those which have flowered under glass to the open border. The roots should be placed in a compost of sandy loam, in well-drained pots, as soon as the foliage dies off, and transferred to a cold frame until introduced into the house. After flowering, the plants should be removed to a cold frame, to be shifted out in the borders when severe frosts are past. Successional batches may be brought in as occasion requires, and, with little trouble, the flowering period can be prolonged from February to June. Plenty of water is necessary when the plants are in full growth, and occasional doses of liquid manure may be employed with advantage.

D. canadensis (Canadian). *fl.* white; spurs two, short, blunt; pedicels short; scape naked, simple, few-flowered. May. *l.*

FIG. 654. DICENTRA EXIMIA.

Dicentra—*continued.*

glaucous, multifid; lobes linear. *h.* 6in. North America, 1822. (B. M. 3031.)

D. chrysantha (golden-flowered).* *fl.* golden-yellow, disposed in erect racemes. Autumn. *l.* very finely cut, glaucous, forming a large tuft, whence issue the rigid, leafy stems. *h.* 3ft. to 5ft. California, 1852. (L. & P. F. G. iii. 103.)

D. cucullaria (hooded). Dutchman's Breeches. *fl.* white, but yellow at the tip; spurs two, straight, acute; scape naked; racemes simple. May. *l.* triternate, smooth, slender. *h.* 3in. to 6in. United States, 1731. (F. d. S. 920.)

D. eximia (choice).* *fl.* reddish-purple, drooping, oblong; spurs two, somewhat incurved, blunt, short; scape naked; racemes compound. Spring and summer. *l.* three to eight, or more; lobes mostly oblong. *h.* 9in. to 18in. United States, 1812. See Fig. 654. (B. R. 50, under name of *Fumaria eximia*.)

D. formosa (beautiful).* *fl.* bright red, broadly ovate; spurs short, very obtuse; scape naked; racemes rather compound. May. *h.* 6in. North America, 1796. Very like *D. eximia*, but smaller in all its parts. SYN. *Fumaria formosa*. (B. M. 1335.)

FIG. 655. DICENTRA SPECTABILIS.

D. spectabilis (showy).* *fl.* rosy-crimson, large, each nearly 1in. long, disposed in a graceful raceme; spurs two, very blunt, ventricose, short. Spring, summer. *l.* stalked, multifid; segments obovate-cuneate, cut. Stem leafy. *h.* 9in. to 2ft. Siberia (1816) and Japan (1846). A very handsome plant, and one of the best hardy herbaceous perennials in cultivation. It is suitable for borders, margins of shrubberies, &c. See Fig. 655. There is also a white-flowered variety.

D. thalictrifolia (Thalictrum-leaved).* *fl.* yellow, with rufescent mouth, fragrant, large, oblong, flattish, nodding, dilated at the base into two horns or gibbosities; racemes axillary or opposite the leaves, on long, filiform peduncles. Autumn. *l.* alternate, decompound; segments ¼in. to 1in. long, oval, oblong, or circular. Stem and branches filiform and twisted. Temperate Himalaya, 1831. Plant glaucous. SYN. *Dactylicapnos thalictrifolia*. (S. B. F. G. s. ii. 127.)

DICERMA. *See* **Desmodium.**

DICHÆA (from *dicha*, bifarious; the leaves are in two rows). ORD. *Orchideæ*. A genus of epiphytal stove Orchids, natives of the West Indies and tropical America. Flowers greenish, solitary, inconspicuous, axillary. Leaves small, ovate-oblong or linear, arranged in a two-ranked manner. Stems short, erect or creeping. There are about a dozen species known, only one of which, perhaps, is in general cultivation. *D. picta* thrives in a warm part of the Mexican house, if grown on a block of wood, with a little moss attached, to prevent the tender roots from drying too much.

D. picta (dotted). *fl.* light leek-green, with purplish dots, axillary; lip unguiculate, sagittate, without any crest; flower-stalks purplish; sepals cuneate-oblong, acute. *l.* distichous, numerous; laminæ linear-lanceolate, acuminate, oblique, nearly perpendicular, glaucous. Trinidad, 1870. A very interesting and elegant little plant. (Ref. B. 84.)

DICHLAMYDEOUS. Furnished with two floral envelopes.

DICHOGAMOUS. When the florets of an inflorescence are of two separate sexes.

Dichorisandra—*continued.*

petals, like the sepals, distinct; stamens six (sometimes only five), all perfect, with short, erect, naked filaments. Stems erect or ascending, often branched. To grow

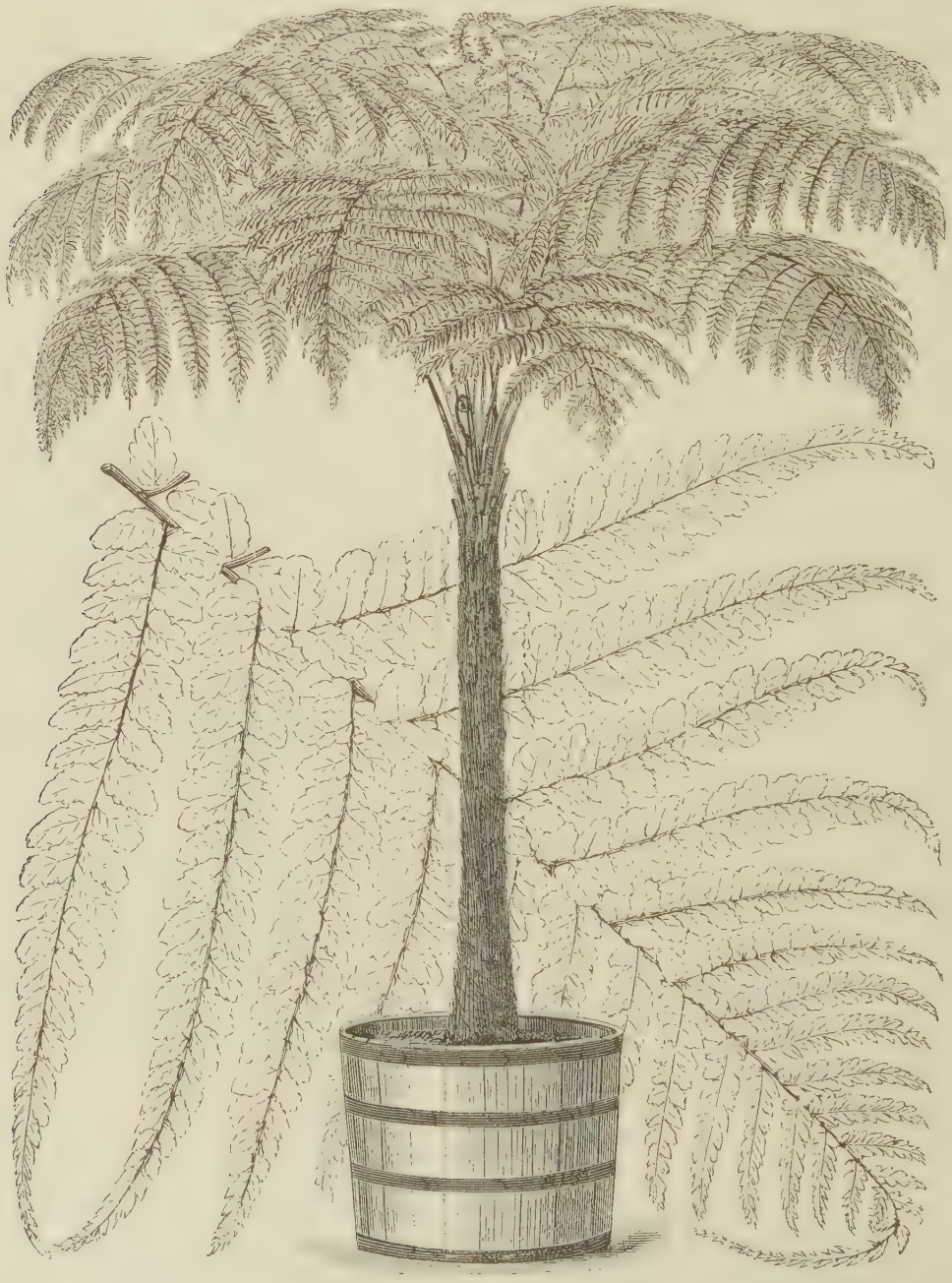


FIG. 656. DICKSONIA BERTEROANA, showing Habit and Upper Portion of Detached Frond (see page 467).

DICHORISANDRA (from *dis*, twice, *chorizo*, to part, and *aner*, an anther; referring to the anthers being two-valved). ORD. *Commelinaceæ*. A genus of stove herbaceous perennials, containing several beautiful-flowered plants, many of which have also very ornamental leaves. Sepals green or coloured, three, sub-equal, ovate or oblong; Dichorisandras vigorously, they should be potted in a compost of peat, loam, and leaf mould, in about equal parts, with the addition of a little silver sand. A liberal supply of water, with ordinary stove heat, and shading from the direct rays of the sun, will be necessary during the summer. In winter, they should be kept much

Dichorisandra—*continued.*

drier, but must not be exposed to cold. Propagated by divisions, by cuttings, or by seeds. Besides the species described below, about seven or eight others are believed to have been introduced.

D. albo-marginata (silvery-margined). *fl.* in a dense raceme, 2in. long; sepals white, blue, and puberulous outside; petals larger, rhomboid-ovate, blue, the lower part white. *l.* lanceolate, acuminate. Stem erect, glabrous, simple or branched above. *h.* 2ft. to 3ft. Brazil, 1868. (R. G. 569.)

D. leucophthalmus (white-eyed).* *fl.* often three together, each on a branch of the peduncle, large; peduncle or scape emerging from a joint at or near the base of the stem, prostrate, glabrous, flexuous, panicled, here and there sheathed with brown scales; bracts from a broad base, subulate, herbaceous; sepals oblong, concave, spreading, between herbaceous and scariose; petals four times as large as the sepals, broadly obovate, spreading, blue-purple, white in the lower half; anthers bright yellow. June. *l.* 4in. to 6in. long, elliptic-lanceolate, sharply acuminated, moderately attenuated below, till they form the sheath; striated, patent, and often recurved. Stems two or three together, erect, terete, jointed, 9in. or more high, glabrous. *h.* 1ft. to 1½ft. Brazil. (B. M. 4733.)

D. musaica (mosaic).* *fl.* bright azure-blue, disposed in a terminal spike or truss. Autumn. *l.* ovate, acute, dark green above, profusely pencilled and veined with zigzag transverse lines of pure white; under side deep reddish-purple. Stems terete, chequered, surrounded at the nodes by close brownish sheaths. *h.* 1½ft. Maynas, 1866. (F. d. S. 1711-2.)

D. oxypetala (sharp-petaled). *fl.*, corolla of three reddish-purple-veined, ovate, acute, spreading petals, with a white spot at the base; pedicels remote, two-flowered, the upper ones very short, the lowest one long, deflexed; pedicels and flowers with small brown ovate bracts; calyx of three ovate, acute, spreading, reddish-purple veined petals, with a white spot at the base; anthers linear-oblong, whitish at the base. August. *l.* confined to the upper part of the stem, alternate, elliptical, attenuated, both at the base and at the extremity, entire, striated, the sides a little incurved, very glabrous, except a little pubescence at the base, on the under side. Stem oblique, simple, or forked. *h.* 2ft. 1810. (B. M. 2721.)

D. picta (spotted). *fl.* purple-blue, with a very distinct white spot at the base, about 1in. across, disposed in short terminal panicles. September. *l.* broad-elliptic, about 4½in. long, green, with a broad stripe of brown on each side, but edged with green. Branches short. *h.* 6in. Brazil, 1830. (B. M. 4760.)

D. Saundersii (Saunders'). *fl.* ⅜in. in diameter, crowded in a dense ovoid, almost capitate panicle, 2in. long; pedicel very short, glabrous; sepals oblong, obtuse, concave, glabrous, white, tipped with violet; petals more than twice as large as the sepals, obovate, concave, rounded at the tip, violet except at the base, which is white. July. *l.* numerous, sub-bifarious, lanceolate, long-acuminate, recurved for the most part, five-nerved, dark green, suddenly contracted at the base into the sheath; margins recurved in the lower part, pale beneath; sheaths hardly tumid, green; mouth rounded. Stem slender, very sparingly branched. Branches slender, cylindrical, terete, pilose. *h.* 2ft. Brazil, 1873. (B. M. 6165.)

D. thyrsiflora (thyrse-flowered).* *fl.* of a rich dark blue, to which the bright yellow anthers form a pleasing contrast; thyrse compact, often 6in. or 7in. in length. Summer and autumn. *l.* broad, sheathing, extremely dark green. *h.* 4ft. Brazil, 1822. A splendid stove plant, of easy culture, now, unfortunately, rarely seen. One of the handsomest flowers of the order. (B. R. 682.)

D. undata (wavy). *l.* broadly ovate, dark green, with longitudinal bands, alternately of green reflected with silver, and of green shaded to black, strikingly undulated or waved; under surface of a uniform purple. Amazons, 1879. A very dwarf-growing species. (F. d. S. 1763-4.)

D. vittata (striped). *l.* purplish-green, with two silvery stripes. Brazil, 1871.

DICHOSMA. *See* **Agathosma.**

DICHOTOMOUS. Divided in twos; stems continually dividing into double ramifications.

DICHROSTACHYS (from *dichros*, two-coloured, and *stachys*, a spike; in allusion to the lower flowers of each spike differing in colour from those above). ORD. *Leguminosæ*. A small genus of four or five species of rigid stove shrubs, extending over tropical Africa and Asia, one being confined to Australia. Flowers, upper ones yellow, hermaphrodite; lower ones either white, pink, or purple, neuter. Leaves bipinnate; leaflets usually small. The under-mentioned is probably the only one yet in cultivation. For culture, *see* **Mimosa.**

D. platycarpa (broad-podded). *fl.*, the upper half of spike bright yellow, the other rose-coloured, produced in pendulous spikes about 1½in. long. *l.* glaucous-green, bipinnate, with fourteen or more pairs of pinnæ; leaflets from twenty-six to thirty pairs. Angola, 1866.

DICHROTRICHUM (from *dichroos*, having two colours, and *thrix*, hair; in reference to the tufts of hair at the end of each seed, in the original species, being differently coloured). ORD. *Gesneraceæ*. A small genus of showy stove perennials, with habit of, and requiring treatment similar to, **Æschynanthus** (which *see*). Probably the only one in cultivation is that here described.

D. ternateum (ternate).* *fl.* crimson-red, tubular, sub-umbellate, in loose cymes. July. *l.* unequal, opposite; the large one cordate. Moluccas, 1872. (B. H. 1871, 22.)

DICKSONIA (named after James Dickson, a famous British cryptogamic botanist). Including *Balantium*, *Cibotium*, *Dennstædtia*, *Patania*, *Sitolobium*. ORD. *Filices*. A genus of about forty species of stove and greenhouse Ferns, the majority being natives of tropical America and Polynesia. Fronds mostly large, decompound, coriaceous. Involucre inferior, sub-globose, coriaceous or membranaceous, cup-shaped, and entire or more or less distinctly two-valved. Sori placed at the apex of a vein, intramarginal. A compost of light, fibrous loam and peat, in equal parts, with about one-third sand, is most suitable. For general culture, *see* **Ferns.**

D. adiantoides (Adiantum-like). *rhiz.* creeping. *fronds* bipinnate; lower pinnæ 1ft. to 2ft. long, 6in. to 12in. broad; pinnules linear, cut down nearly to the rachis; segments oblong-rhomboidal, blunt, with two to four bluntish lobes in each side. *sori* two to eight to a segment. West Indies, 1828. Stove. (H. S. F. i. 26 B.)

D. antarctica (Antarctic).* *cau.* 30ft. to 35ft. high. *sti.* under 1ft. long, scaly. *fronds* rhomboid, tripinnate, 5ft. to 6ft. long, 2ft. to 3ft. broad in centre; central pinnæ 1ft. to 1½ft. long, 4in. to 5in. broad; pinnules sessile, linear, ⅓in. broad; segments oblong. *sori* six to ten to lowest segment. 1786. Arborescent. Greenhouse.

D. arborescens (tree-like). *cau.* 10ft. high. *fronds* bipinnate; lower pinnæ 1ft. to 1½ft. long, 6in. to 9in. broad; pinnules linear, deeply cut; segments ¼in. long, oblong. *sori* two to six to a lobe, large, globose. St. Helena, 1824. Arborescent. Greenhouse. (H. S. F. i. 22A.)

D. assamicum (Assam). A synonym of *D. Barometz.*

D. Barometz (Barometz). *fronds* tripinnate; lower pinnæ ovate-lanceolate, 1ft. to 2ft. broad; pinnules linear-acuminate, cut, nearly to the rachis; segments linear-oblong, acute, sub-falcate. *sori* two to twelve to a lobe. Assam, China, 1824. Arborescent. Greenhouse. SYN. *D. assamicum.* (H. S. F. i. 29 B.)

D. Berteroana (Bertero's).* *cau.* 6ft. to 15ft. high. *fronds* rhomboid, tripinnate; pinnæ oblong-lanceolate, 1ft. to 1½ft. long, 5in. to 6in. broad; pinnules sessile, lanceolate, about 1in. broad; segments close, lanceolate, sterile sub-entire, fertile deeply pinnatifid. Juan Fernandez, 1880. Arborescent. Greenhouse. See previous page, Fig. 656, for which we are indebted to Messrs. Veitch and Sons. (H. S. F. i. 23 A.)

D. Chamissoi (Chamisso's). *fronds* tripinnate; lower pinnæ ovate-lanceolate, 1ft. to 1½ft. long, 6in. to 9in. broad; pinnules linear-acuminate, cut down to the rachis below; segments oblong, bluntish. *sori* two to twelve to a lobe. Sandwich Islands, 1876. Stove.

D. chrysotricha (golden-haired).* *fronds* bipinnate; lower pinnæ 1ft. to 1½ft. long, 6in. to 9in. broad; pinnules linear, very deeply cut; segments linear-oblong, deeply toothed, ⅓in. long; fertile pinnules slightly contracted; main rachis clothed with a thick coat of shining yellowish-brown hairs at the base. Java, 1875. Arborescent. Stove.

D. cicutaria (Cicuta-like). *rhiz.* creeping. *fronds* bipinnate; lower pinnæ 1ft. to 1½ft. long, 6in. broad; pinnules linear-acuminate, deeply cut; segments oblong-deltoid, deeply incisio-pinnatifid. *sori* two to twelve to a segment. West Indies. Stove.

D. Culcita (Culcit). *rhiz.* densely clothed with shining hairs. *fronds* 1ft. to 1½ft. long, 1ft. broad, tripinnate; lower pinnules deltoid, their divisions ovate, deeply cut with oblong-rhomboidal, unequal-sided, deeply-toothed segments; fertile fronds much contracted. *sori* one line across. Madeira and the Azores. The dense woolly covering of the rhizomes has become an article of commerce; it is used for stuffing cushions, &c. Greenhouse. See Fig. 657.

D. cuneata (cuneate). *fronds* sub-deltoid, four-pinnatifid; pinnæ lanceolate, 6in. to 12in. long; pinnules close, short-stalked, lanceolate, ⅓in. broad; segments oblong-rhomboidal, inciso-pinnatifid. *sori* at base of ultimate sinuses. Philippines. Stove. (H. S. F. i. 28 C).

D. davallioides (Davallia-like). *fronds* tripinnate; lower pinnæ 6in. to 9in. long, 3in. to 4in. broad; pinnules linear-acuminate, cut down to the rachis; segments oblong-rhomboidal, deeply inciso-pinnatifid. *sori* two to eight to a segment. Australia. Greenhouse.

D. dissecta (cut-leaved). A synonym of *D. rubiginosa.*

D. fibrosa (fibrous).* *sti.* very short, densely scaly. *fronds* rhomboid, tripinnate, 3ft. to 4ft. long; central pinnæ lanceolate, 6in. to 9in. long; pinnules sessile, linear, 1in. to 1½in. long; segments crowded, deltoid, falcate, deeply pinnatifid. *sori* four

Dicksonia—*continued.*

FIG. 657. DICKSONIA CULCITA.

to six to largest segment. New Zealand. Arborescent. Greenhouse. (H. S. F. i. 23 B.)

D. flaccida (weak). *fronds* tripinnate; lower pinnæ 9in. to 15in. long, 6in. broad; pinnules lanceolate, cut down to the rachis; lower segments ovate-rhomboidal, bluntish, cut down to the rachis three or four times on each side, and the lobes again toothed. *sori* two to eight to a segment. Aneiteum, &c. Very closely allied to *D. rubiginosa*. Stove.

D. glauca (glaucous). *fronds* tripinnate, ovate-lanceolate, 1ft. to 1½ft. long, 6in. to 9in. broad; pinnules linear-acuminate, cut down to the rachis in the lower part; lobes linear-oblong. *sori* two to twelve to a lobe. Sandwich Isles, 1879. Arborescent. Stove. (H. S. F. i. 29 A.)

D. lanata (woolly). *cau.* low. *sti.* about 1ft. long. *fronds* rhomboid, tripinnate, 3ft. to 4ft. long; central pinnæ oblong-lanceolate, about 1ft. long; pinnules lanceolate, stalked, 1½in. to 3in. long, less than 1in. broad. *sori* crowded, six to twelve to largest segment. New Zealand. Greenhouse. (H. S. F. i. 23 C.)

FIG. 658. DICKSONIA MENZIESII.

D. Menziesii (Menzies').* *fronds* tripinnate; lower pinnæ 1ft. to 1½ft. long, 6in. to 9in. broad; pinnules linear-acuminate, cut down about half-way to the rachis; lobes rounded, blunt. *sori* two to eight. Sandwich Islands, 1876. Stove. See Fig. 658. (H. S. F. i. 29 C.) *D. pruinata* is a form having lobes of the pinnules denticulate.

D. moluccana (Moluccas). *fronds* tripinnate; lower pinnæ 1ft. to 1½ft. long, 9in. to 18in. broad; pinnules linear-lanceolate, cut down to the rachis; lower segments oblong-rhomboidal, deeply

Dicksonia—*continued.*

cut, with blunt, oblong-deltoid lobes. *sori* two to twelve to a segment. Main and secondary rachises prickly. Java. Stove. *D. scandens* is probably a variety of this species.

D. pilosiuscula (slightly hairy). A synonym of *D. punctilobula*.

D. punctilobula (dotted-lobed). *fronds* 1ft. to 1½ft. long, 6in. to 9in. broad, lanceolate, bipinnate; lower pinnæ lanceolate, 4in. to 6in. long, deeply cut; pinnules ovate-rhomboidal, about ¼in. long, deeply pinnatifid. *sori* two to twelve to a pinnule. North America, 1811. This is the only hardy species of the genus Pleasantly fragrant. SYN. *D. pilosiuscula*.

D. regalis (regal).* *fronds* oblong-deltoid, tripinnate; pinnæ oblong-lanceolate, 1½ft. to 2ft. long, 10in. to 12in. broad; pinnules sessile, 1in. to 1½in. broad, cut down to the rachis; segments close, lanceolate-falcate, inciso-pinnatifid. *sori* ten to twelve to a segment. Mexico, 1864. Arborescent. Greenhouse. SYN. *Cibotium regale*.

D. rubiginosa (rusty). *fronds* tripinnate; lower pinnæ 1ft. to 1½ft. long, 6in. to 9in. broad; pinnules linear, cut down to the rachis; lower segments deltoid, or oblong-rhomboidal, deeply inciso-pinnatifid. *sori* two to twelve to a segment. Tropical America. Stove. SYN. *D. dissecta*. (H. S. F. i. 27 A.) *D. anthriscifolia* is a variety with segments larger and more divided.

D. Schiedei (Schiede's). *cau.* 10ft. to 15ft. high. *fronds* oblong-deltoid, tripinnate; pinnæ oblong-lanceolate, 1ft. to 2ft. long; pinnules linear-lanceolate, deeply cut; segments close, lanceolate, dentate. *sori* four to six to a segment. Mexico, 1846. Greenhouse. (H. S. F. i. 30 A.)

D. Sellowiana (Sellow's).* *fronds* 6ft. to 8ft. long, 2ft. to 3ft. broad, lanceolate, bipinnate; lower pinnæ 1ft. to 1½ft. long, 3in. to 4in. broad; pinnules linear, deeply cut; segments ¼in. long, close, oblong-deltoid. *sori* two to six to a lobe. Brazil, 1871. Arborescent. Stove. (H. S. F. i. 22 B.)

D. spectabile (showy). A garden synonym of *D. Wendlandi*.

D. squarrosa (rough-stemmed).* *sti.* castaneous, 6in. to 12in. long, densely scaly. *fronds* oblong-deltoid, tripinnate; pinnæ oblong-lanceolate, 9in. to 15in. long, 4in. to 6in. broad; pinnules subsessile, linear, 2in. to 3in. long; segments lanceolate. *sori* six to eight to lower segments. New Zealand. Arborescent. Greenhouse.

D. Wendlandi (Wendland's). *fronds* oblong-deltoid, tripinnatifid; pinnæ oblong-lanceolate, 1ft. long, 4in. to 6in. broad; pinnules sessile, linear, cut down to a narrow wing; segments close, lanceolate, acute. *sori* close, four to eight to a segment. Arborescent. Guatemala. Stove. SYN. *D. spectabile*, of gardens.

D. Youngiæ (Mrs. Young's). *sti.* 6in. to 9in. long, castaneous, densely scaly. *fronds* oblong-deltoid, tripinnate; pinnæ oblong-lanceolate, 1ft. long, 5in. to 6in. broad; pinnules sub-sessile, lanceolate, 2in. to 3in. long; segments lanceolate, close. *sori* six to eight to lower segments. Australia, 1865. Arborescent. Greenhouse.

FIG. 659. FLOWERING BRANCH OF DICTAMNUS ALBUS
(see page 469).

DICLINOUS. Having stamens in one flower, and pistils in another.

DICLIPTERA (from *diklis*, double-doored, and *pteron*, a wing; referring to the two-celled winged capsule or seed-vessel). ORD. *Acanthaceæ*. A genus of stove or greenhouse annuals, perennials, and evergreen herbs, rarely, if ever, seen in cultivation outside botanic gardens. There are about fifty species. For culture, *see* **Justicia.**

D. Tweediana (Tweedie's). *fl.* orange-red, numerous, tubular. Autumn. *l.* opposite, oblong-obtuse. Monte Video, 1874. A very showy greenhouse perennial, with numerous stems. (R. H. 1874, 171.)

DICLYTRA. *See* **Dicentra.**

Dictamnus—*continued.*

Rutaceæ. A strong-smelling herb. Flowers white or rosy, showy. Leaves alternate, impari-pinnate, exstipulate, with four to six pairs of serrulate leaflets, full of pellucid dots. Stems glandular at the apex. It is of easy culture in ordinary garden soil, preferring, however, a rather dry position. Propagated by divisions; or by seed, which should be sown when secured.

D. albus (white).* Fraxinella. *fl.*, racemes long, terminal. May June. *l.* pinnate; leaflets four to five pairs, cordate at the base, acute at the apex, finely serrulated. *h.* 1ft. to 1½ft. South Europe, 1596. The whole plant, especially when gently rubbed, emits an odour like that of lemon-peel; but, when bruised, it has something of a balsamic scent. Eastern Europe, Asia. SYN.

FIG. 660. DIEFFENBACHIA AMŒNA (see page 472).

DICOTYLEDONOUS. Having two cotyledons.

DICOTYLEDONS. This name is now more generally used than Exogens. It is one of the two classes into which Phænogamous or flowering plants are divided. The distinguishing characteristics may be briefly stated: Flowers with the organs mostly in fours or fives. Embryo with opposite cotyledons. Leaves usually with netted veins. Stem with bark, pith, and interposed wood; when perennial, increasing annually in diameter by a layer of wood, added to the outside of the old wood, and another of bark added to the inside of the old bark.

DICTAMNUS (from *Diktamnos*, the old Greek name used by Hippocrates). Dittany, or Fraxinella. ORD. *D. Fraxinella.* See Fig. 659, page 468. There are varieties with white, and also with pale purple, flowers.

D. Fraxinella (Fraxinella). A synonym of *D. albus.*

DICTYANTHUS (from *diktyon*, network, and *anthos*, a flower; alluding to the markings on the corolla). SYNS. *Rytidoloma, Tympananthe.* ORD. *Asclepiadeæ*. Pretty stove climbers. Besides the one described below, there are three other species not yet introduced to cultivation. All are natives of Mexico. For culture, *see* **Passiflora.**

D. Pavonii (Pavon's). *fl.*, corolla whitish, spotted, elegantly veined. September. *l.* opposite, cordate. *h.* 10ft. 1854. (B. M. 4750.)

DICTYMIA. *See* **Polypodium.**

DICTYOGRAMMA. *See* **Gymnogramme.**

DICTYOPTERIS. *See* **Polypodium.**

DICTYOSPERMA (from *diktyon*, a net, and *sperma*, a seed; in allusion to the raphe of the seed forming a loose network.). ORD. *Palmæ*. A genus of stove Palms, related to *Areca*. Flowers unisexual, often in threes (one female between two males). Leaves pinnate; leaflets with the sides reflexed before unfolding. For culture, *see* **Areca.**

D. album (white).* *l.* 4ft. to 8ft. long, pinnate; petioles clothed with white tomentum; leaflets 2ft. long, and about 2in. wide, bright green on both surfaces. Stem slender. *h.* 30ft. Mauritius, 1842. Whole plant unarmed. SYN. *Areca alba.*

Dictyosperma—*continued.*

D. aureum (golden).* *l.* pinnate, with long, narrow, distant, pendent, dark green leaflets. Seychelles Islands, 1868. A fine species, of erect habit, and with gracefully spreading leaves, remarkable for the yellow colour acquired by the petioles when grown in a temperate house. SYN. *Areca aurea.*

FIG. 661. DIEFFENBACHIA CARDERI (see page 473).

D. furfuraceum (mealy) differs principally from *D. rubrum* in the tomentose character of the petiole and leaf sheath of the young plant. Mauritius. SYNS. *Areca furfuracea* and *A. pisifera.*

D. rubrum (red). Palmiste Rouge. *l.* dark green, with primary veins and margins dark red, the redness disappearing very much in adult plants. Branches of the spadix longer and more reflexed than in *D. album.* Mauritius. SYN. *Areca rubra.*

DICTYOXIPHIUM (from *dictyon*, a net, and *xiphos*, a sword; having sword-shaped fronds, with netted veins). ORD. *Filices*. A monotypic genus, allied to *Lindsaya*. Sori marginal, continuous. For culture, *see* **Ferns.**

D. panamense (Panama). *fronds* tufted, sessile, 2ft. to 3ft. long; barren ones 2in. to 3in., fertile ones ½in. to 1in., broad, narrowed from the middle gradually downwards, quite entire. *sori* in a continuous marginal line. Tropical America.

DICYRTA (from *dis*, twice, and *kyrtos*, curved; the lower portion of the inside of the throat having two tubercular folds). ORD. *Gesneraceæ*. A genus containing two species of dwarf herbs, natives of Central America. Flowers white or pale lilac, often spotted, small. Leaves opposite, membranous, villous. For culture, *see* **Achimenes.**

D. candida (white). *fl.* white, solitary, axillary; the small corollas having a slightly curved tube, and an unequally five-lobed limb. July. *l.* opposite, on long petioles. *h.* 1½ft. 1848.

DIDISCUS. This genus is now included by Bentham and Hooker under **Trachymene** (which *see*).

DIDYMOCARPUS (from *didymos*, twin, and *karpos*, a fruit; in reference to the twin capsules). ORD. *Gesneraceæ*. A genus of about forty species of stove perennial, stemless or caulescent herbs, natives of tropical Asia. Flowers violaceous-blue or rarely yellow, disposed in dichotomous umbels; corolla funnel-shaped, with a ventricose throat. Leaves usually cordate, crenated, wrinkled, hairy. They succeed in a compost of peat, loam, and dried cow-dung, with the addition of a little sand. Propagated by cuttings, obtained from young shoots, when commencing growth; these should be placed in sandy soil, and in bottom heat.

D. crinita (hairy). *fl.* white, tinged with purple; tube incurved, swelling above; peduncles two to five together, axillary, one-flowered. July. *l.* alternate, 9in. to 10in. long, spathulate, acute, serrated, pilose, red. Stem short, thick, erect. *h.* 1ft. Pulo-Penang, 1845. (B. M. 4554.)

FIG. 662. DIEFFENBACHIA MAGNIFICA (see page 474).

D. Humboldtiana (Humboldt's). *fl.* pale lilac; panicle rather loose, five or six-flowered. October. A very neat and pretty little plant. (B. M. 4757.)

D. primulæfolia (Primrose-leaved).* *fl.* lilac; peduncles twin, many-flowered, and, as well as the calyces, pilose. November. *l.* cordate-oval, petiolate, twice crenated, wrinkled and silky on both surfaces. Stem downy, bearing four crowded leaves at top. *h.* 3in. to 6in. Ceylon, 1858. (B. M. 5161.)

DIDYMOCHLÆNA (from *didymos*, twin, and *chlaina*, a cloak; referring to the coverings of the spore-cases). Including *Sphærostephanos*. ORD. *Filices*. A small genus of stove Ferns, containing but the two species described below. Involucre elliptical, emarginate at the base, attached to the linear receptacle, free all round the edge. Sori elliptical, terminal on a veinlet, but distinctly intramarginal. For general culture, *see* **Ferns.**

Didymochlæna—*continued.*

D. lunulata (crescent-like).* *cau.* erect, sub-arborescent. *fronds* densely tufted, 4ft. to 6ft. long, bipinnate; pinnules ¾in. to 1in. long, dimidiate, sub-quadrangular, entire, or slightly sinuated. *sori* two to six to a pinnule. Tropical America. SYN. *Aspidium truncatulum.*

D. polycarpa (many-fruited). *cau.* erect; rachis and lower surface villose. *fronds* tufted, short, 2ft. to 3ft. long, 1ft. to 1½ft. broad, simply pinnate; pinnæ close, very numerous, spreading, dwindling down below to mere auricles. *sori* small, close, ultimately confluent. Malaya. SYNS. *Mesochlæna polycarpa* and *Nephrodium javanicum.*

D. p. asplenioides (Asplenium-like) is a hairy form, with narrower pinnæ and short oblong-deltoid lobes.

DIDYMOSPERMA (from *didymos*, double, and *sperma*, a seed; in allusion to the (frequently) two-seeded fruits). ORD. *Palmæ.* A genus of unarmed stove Palms. Flowers monœcious in the same or separate spadices; male with free or connate imbricate sepals; female with valvate petals; spadix flowering amongst the leaves; spathes usually many. For culture, *see* **Areca.**

D. nanum (dwarf).* *l.* about 2ft. long; petiole short, roundish; pinnules alternate or sub-opposite, cuneate towards the base, above this oblique, variously lobed, toothed and spinuloso-serrate, the terminal irregular in shape, generally bilobed, striately veined, green above, glaucous-white beneath. Assam and Khasia Mountains. SYN. *Wallichia nana.*

D. porphyrocarpon (purple-fruited). *l.* with petiole 4ft. to 8ft. long; segments nine to seventeen, wedge-shaped, sub-panduriform, sinuate, 6in. to 12in. long, 2in. to 5in. wide, glaucous beneath, caulescent. Rhizome underground, creeping. Java.

Didymosperma—*continued.*

D. tremulum (tremulous). *l.*, segments long, flat, firm, linear, spinuloso-dentate, bifid at the apex; laciniæ unequal or panduriform. Stem 3ft. to 4ft. high. Philippine Islands.

DIDYMOUS. Two; united, or in pairs.

DIDYNAMOUS. When (usually in a bilabiate flower) there are four stamens in two pairs, those of one pair longer than those of the other.

DIEFFENBACHIA (named in honour of Dr. Dieffenbach, a German botanist). ORD. *Aroideæ* (*Araceæ*). A genus of noble erect stove evergreen perennials, with often handsomely variegated foliage. Leaves usually green, sometimes irregularly marked with white or yellowish spots, oblong, with numerous veins diverging from the midrib. Stems fleshy, from 6ft. to 8ft. long. The poisonous and very acrid juice of this genus causes intense pain, and no part of the plant should, under any consideration, be placed in the mouth. For culture, *see* **Caladium.**

FIG. 663. DIEFFENBACHIA NOBILIS (see page 474).

D. amœna (pleasing).* *l.* deep green, oblong-acute, marked with very abundant elongate blotches of white and pale yellow, which are well defined on both surfaces. Tropical America, 1880. Very effective. See page 469, Fig. 660, for which we are indebted to Mr. Wm. Bull.

D. antioquiensis (Antioquian). *l.* deep green, blotched with yellow. Columbia, 1875. (I. H. n. s. 192.)

D. Baraquiniana (Baraquin's).* *l.* bright light green, irregularly spotted with white, 6in. to 12in. long, 3in. to 6in. in width, oblong-acuminate; midrib pure white; petioles shining, clear

Dieffenbachia—*continued.*

ivory-white. *h.* 5ft. Brazil, 1863. SYN. *D. Verschaffeltii.* (I. H. 1864, 387.)

D. Bausei (Bause's).* *l.* yellowish-green, margined and irregularly blotched with dark green, and profusely spotted with white; broad, from 1ft. to 1¼ft. long; petioles white. A garden hybrid. (I. H. n. s. 338.)

D. Bowmanni (Bowmann's). *l.* rich deep green, blotched with irregular parallel markings of a pretty light pea-green; very large, growing to a length of 2½ft., and having a breadth of about 1ft. Brazil, 1871. (I. H. xix. 105.)

D. brasiliensis (Brazilian).* *l.* dark green, suffusely spotted with blotches of white and pale green; oblong, acuminate. Brazil, 1872. A very distinct sort.

Dieffenbachia—*continued.*

D. eburnea (ivory).* *l.* delicate light green, profusely dotted and spotted with white; oblong-lanceolate. Stems and footstalks stained with pale cinnamon, and ribbed with ivory-white. Brazil, 1868. A very pretty species, with a close and compact habit.

D. gigantea (gigantic). *l.* spotted with cream-colour. Stems white, prettily mottled with light green spots. Brazil, 1864. A fine bold-growing plant. (I. H. 470.)

D. grandis (large). *l.* green, mottled. Brazil, 1864.

D. imperator (commanding). *l.*, ground colour olive-green, fantastically blotched, marbled, and spotted with pale yellow and white; 1½ft. to 1½ft. in length by 5in. in breadth, ovate-lanceolate. Columbia.

FIG. 664. DIEFFENBACHIA REGINA (see page 474).

D. Carderi (Carder's). *l.* rich dark green, strikingly blotched and variegated; oblong-ovate, somewhat deflexed. Columbia, 1880. See page 470, Fig. 661, for which we are indebted to Mr. Wm. Bull.

D. chelsoni (Chelsea).* *l.* dark satiny-green, the midrib marked with a grey band, which runs out into a feathered edge, and extends about one-third across each half of the blade, the surface of which is also freely spotted and blotched with bright yellow-green for about two-thirds of its breadth. Columbia, 1877. A very handsome species.

D. costata (ribbed). *l.* deep velvety-green, with distinct ivory-white midrib, more or less profusely spotted with oblong ivory-white blotches; ovate, blunt at the base, undulated at the edge, acuminate at the apex, about 9in. long. Columbia, 1860.

D. delecta (select). *l.*, surface satiny, with whitish variegation; elliptic-lanceolate, 8in. to 10in. long, spreading. Stems mottled green. Columbia, 1880.

D. imperialis (imperial). *l.* dark green, with yellow spots; midrib greyish. South America, 1871. (I. H. 1871, 85.)

D. insignis (remarkable). *l.* dark green, with irregular angular blotches of pale yellowish-green; 6in. or more in breadth, obliquely ovate, shortly acuminate; petioles pale green. Columbia.

D. latimaculata (broad-spotted).* *l.* dark glaucous-green, interspersed with white bars, spotted and blotched irregularly with yellowish-green; somewhat acute-sagittate; petioles glaucous. Stem erect, supporting a fine crown of leaves. Brazil, 1871. (I. H. 112.) A variety, named *illustris* (I. H. 234), has the leaves banded with yellow, green, and grey, on a ground of deep green. 1876.

D. Leopoldi (Leopold's).* *l.* of a rich deep lustrous satiny-green, oblong-ovate; midrib broad, ivory-white, bordered on each side with a whitish band. South America. A very fine species, described as of resplendent beauty. (G. C. n. s., ix. 441.)

Dieffenbachia—*continued.*

D. maculosa (spotted). *l.* blotched with creamy-white. Columbia, 1876.

D. magnifica (magnificent).* *l.* shining, sombre green, thickly variegated (following the direction of the secondary nerves) with blotches and spots of white. Stem and petioles also variegated; the latter are short and sheathing. Venezuela. See page 471, Fig. 662.

D. majestica (majestic).* *l.* rich dark green, variegated with scattered bright yellowish blotches, and having besides a feathery silver bar along the central line; oblong-ovate, acuminate, 1ft. or more in length, and 5in. to 6in. in breadth. 1882. Very distinct, and stocky in habit.

D. nitida (shining). *l.* deep glossy green, marked with angular blotches of bright yellowish-green; oblong-lanceolate, acuminate. Stems erect. Columbia.

D. nobilis (noble).* *l.* deep rich green, profusely blotched and spotted with white, except at the edges, where the ground colour forms a broad marginal band; oblong-ovate, about 1½ft. long, and 9in. broad; petioles thick and channelled, pale green, transversely banded with a different shade of the same colour, nearly 1ft. long. Brazil, 1869. See page 472, Fig. 663. (G. C. 1873, 815.)

D. Parlatorei marmorea (Parlatore's marbled). *l.* blotched with greenish-white. Antioquia, 1878. (I. H. n. s. 201.)

D. Pearcei (Pearce's). *l.* bright light green, profusely spotted and blotched with creamy-white, each side of the midrib with a band of the same colour; large, oblong-lanceolate. Ecuador.

D. picta (spotted). *l.* spotted with white. Tropical America, 1820.

D. princeps (illustrious).* *l.* dark green, with a few scattered yellowish spots, and a silver-grey marking running through the centre; somewhat oblique, the narrower side being most distinctly cordate. Brazil, 1868.

D. Regina (Queen).* *l.* oblong-elliptic, rounded at the base, shortly acuminate, almost wholly covered with greenish-white, mottled with blotches of pale green, and having a narrow margin, and a few streaky markings of a deeper shade; the greater portion of the upper surface of the leaf-blade, whose two sides are nearly equal in breadth, is of this pallid hue, with the few but distinct dark markings. South America. This beautiful plant is a very distinct and striking addition to the genus. See preceding page, Fig. 664, for which we are indebted to Mr. Wm. Bull.

FIG. 665. DIEFFENBACHIA REX.

D. Rex (King).* *l.* closely placed on the stem; leaf-blades elliptic-lanceolate, unequal-sided, of a very deep green colour, passing to paler green near the edge of the narrow side, the whole surface, to within about ¼in. of the margin, thickly covered with oblique-elongate angular white blotches, which take the same direction as the venation, and are here and there slightly veined and suffused with green. South America. A very handsomely marked plant, of free and vigorous habit. See Fig. 665, for which we are indebted to Mr. Wm. Bull.

D. Seguine (Seguine). Dumb Cane. *l.* deep green, marked with pellucid white spots, ovate-oblong, cuspidate, undulated. *h.* 6ft. West Indies.

D. Shuttleworthii (Shuttleworth's). *l.* with a feathery white band along the midrib. Columbia, 1878. (G. C. n. s., x. 45.)

D. splendens (splendid). *l.* of a rich deep velvety bottle-green, freely marked with whitish striated blotches, which stand out in striking contrast with the deep green ground colour. Stem faintly mottled with dark and light green. Columbia, 1880.

Dieffenbachia—*continued.*

D. triumphans (triumphant). *l.* dark green, covered with large, irregular, angular, yellowish-green blotches, somewhat spreading, ovate-lanceolate, attenuately acuminate, about 1ft. long, and 4in. to 5in. wide. Columbia. A very ornamental species.

D. velutina (velvety). *l.* satiny-green; petioles white. Columbia, 1877.

D. Verschaffeltii (Verschaffelt's). A synonym of *D. Baraquiniana.*

D. vittata (striped). *l.* greyish-green, with two feathery white bands. Tolima.

D. Wallisii (Wallis's).* *l.* ovate-lanceolate, of a rich dark green, marked along the midrib with broad feathery bands of a light grey, ornamented with irregular blotches of the same colour towards the margin. Columbia, 1870. (I. H. 1870, 11.)

D. Weirii (Weir's). *l.* bright green, thickly blotched and spotted with pale yellow. Brazil, 1866. A fine species, of dwarf habit.

DIELYTRA. This name, by an erroneous conjecture, was changed from *Diclytra*, in the first instance accidentally printed for **Dicentra** (which *see*).

DIERAMA. *See* **Sparaxis pendula** and **S. pulcherrima.**

DIERVILLA (named in honour of M. Dierville, a French surgeon). SYN. *Weigelia.* ORD. *Caprifoliaceæ.* A genus of very handsome hardy shrubs. Flowers white, purple, pink, or yellow, in axillary and terminal clusters; corolla funnel-shaped or campanulate; tube regular. Leaves opposite, sessile, or petiolate, serrated. These elegant shrubs are of very easy culture in common garden soil, if the situation is a rather moist and shaded one. Propagation may be readily effected by cuttings, made in spring or autumn, or by the freely-produced suckers. The gracefully spreading form of Diervillas renders them remarkably well adapted for shrubberies; and *D. grandiflora*, in particular, can be very successfully grown as a wall-plant.

FIG. 666. DIERVILLA ROSEA.

D. amabilis (lovely). A synonym of *D. grandiflora.*

D. canadensis (Canadian). A synonym of *D. trifida.*

D. floribunda (many-flowered). *fl.*, corollas purplish, narrow, tubular, only slightly expanded towards the mouth. June. *h.* 3ft. Japan, 1864. SYN. *D. multiflora.* (I. H. 383.)

D. grandiflora (large-flowered).* *fl.* pink. Early summer. *l.* strongly reticulated, the veins being very prominent on the under side. *h.* 8ft. Japan. SYN. *D. amabilis.* (F. d. S. 855.) There are several very ornamental varieties: *Isolinæ*, flowers white, with a yellow blotch in the throat (F. d. S. 1445); *striata*, striped red and white (F. d. S. 1446); and *Van Houttei*, white and rose, very showy (F. d. S. 1447); another variety, *variegata*, has prettily variegated leaves (F. d. S. 1189).

D. hortensis (garden). *fl.* red or white; corolla tube slender, slightly hairy outside, glabrous within; limb regular, with spreading ovate lobes. *l.* stalked, ovate, acuminate, crenate, or crenate-serrulate, softly hairy. *h.* 4ft. to 5ft. Japan. (S. Z. F. J. 29.)

D. Middendorfiana (Middendorf's). *fl.* yellowish-white, dotted with pink on the lower petal; panicles terminal. *l.* nearly sessile, ovate-lanceolate, finely reticulated, hairy on the nerves. Siberia.

D. multiflora (many-flowered). A synonym of *D. floribunda.*

D. rosea (rose).* *fl.* rosy or white, very numerously produced. Spring. *l.* ovate-lanceolate, serrulate. *h.* 6ft. China, 1844. See Fig. 666. Of this widely-grown species, there are several excellent varieties: *nana* is a very compact, dwarf-growing form: *nana aurea* is like *nana*, except that the foliage (particularly in a young state) is a rich golden colour; *Stelzneri* is a very floriferous purplish-red form.

Diervilla—*continued.*

D. trifida (trifid). *fl.* yellow. Summer. *l.* on short petioles, ovate, acuminated, serrated, and, as well as the petioles, glabrous. Root creeping. *h.* 3ft. to 4ft. North America, 1739. SYN. *D. canadensis.*

DIFFUSE. Scattered; widely spread.

DIGGING. For pulverisation and mixing-in of manures, Digging is best performed (says Loudon) in dry weather; but, for the purpose of aëration, a degree of moisture and tenacity in the soil is more favourable. In Digging, a uniform depth should be preserved throughout, the full length of the spade being inserted nearly vertically, and the spit turned over, so that what was before underneath may now be exposed to the air. An open trench, the length of the ground to be dug, should first be made, and the soil thus removed transferred to the place where it is intended to finish. In order to leave the surface, when completed, evenly disposed, the trench must be kept tolerably straight, and of about an even width. Ground that has been occupied by garden crops in summer, is best thoroughly dug in the autumn, and manure added. It should not be broken by the spade, but left rough for full exposure to the frost, and for the consequent aëration in winter. The following spring, such soil will be found to work well, and may be prepared, by levelling down, for any desired crop. The strength of the manure will also have become incorporated with the soil underneath—a condition that cannot be obtained by adding it at planting time. The width of ground taken as a spit must not exceed about 9in. in heavy soils, or the bottom will be left undisturbed. Digging is best performed when the soil is somewhat dry, and should never be practised when it is frozen or covered with snow. Light soils, or those resting on a gravelly bottom, may be worked at many times when it would be very unwise to tread on those of a clayey nature. The workman, when Digging, should stand nearly erect, insert the spade vertically, to secure the removal of soil to the full depth, and turn the spit from the direction in which he is standing. If a competent man, he will be able to reverse the position of his hands on the spade, and proceed either way with equal facility.

Double-digging is performed by having a trench of double width, removing a spit of the earth on the top, then Digging underneath, and allowing that portion to remain. Another width is then marked out, the top soil from this placed on the other, and each portion treated successively in a similar manner. This method is often adopted where sub-soils are poor, so that the depth of two spits may be reached, without introducing the inferior soil to the surface.

DIGITALIS (from *digitus*, a finger; referring to the shape of the flowers). Foxglove. ORD. *Scrophularineæ.* A genus of eighteen species of very showy hardy biennial or perennial herbs, confined to Europe, North Africa, and West Asia. Flowers purple, yellowish, or white, disposed in long terminal, sometimes secund, racemes; corolla tubular at the base, funnel-shaped; limb obliquely four-lobed; upper segment much shorter than the lower one or lip, and, as well as that, imbricate in æstivation. The culture of this genus is very simple; the plants thriving in any ordinary garden soil. Seeds should be sown in April or May, and the seedlings, when large enough to handle, may be planted out 6in. apart. Also increased by divisions.

D. ambigua (ambiguous).* *fl.* yellowish, reticulated with brown, large, 2in. long; lower bracts about equal in length to the flowers. July, August. *l.* ovate-lanceolate, toothed, sessile, nerved, downy beneath. *h.* 2ft. to 3ft. Europe, 1596. Perennial. Plant hairy. SYNS. *D. grandiflora* and *D. ochroleuca.* (B. R. 64.)

D. a. fuscescens (dark brown). A variety with brown flowers, which are smaller than those of the type.

D. aurea (golden). A synonym of *D. ferruginea.*

D. dubia (doubtful). *fl.*, corolla purplish, large for the size of the plant, marked by many spots inside; throat dilated; racemes

Digitalis—*continued.*

few-flowered. June. *l.* glabrous above, downy beneath; radical ones recurved to the ground, lanceolate, flat, denticulated; upper ones quite entire. *h.* 6in. to 9in. Spain, 1789. Perennial. SYN. *D. minor.* (B. M. 2160.)

D. ferruginea (rusty). *fl.* rusty, reticulated inside, downy outside; lip of corolla ovate, entire, bearded; racemes long, dense, pyramidal. July. *l.* glabrous or ciliated. Stem glabrous, densely leafy. *h.* 4ft. to 6ft. Europe, 1597. Biennial. SYN. *D. aurea.* (B. M. 1828.)

D. grandiflora (large-flowered). A synonym of *D. ambigua.*

D. laciniata (jagged-leaved). *fl.*, corolla yellow, downy, with ovate, bearded segments; raceme sub-secund; bracts all much shorter than the pedicels. June. *l.*, lanceolate, jagged, glabrous. *h.* 1½ft. to 2ft. Spain, 1827. Perennial. (B. R. 1201.)

D. lævigata (smooth). *fl.* scattered, glabrous; corolla fulvous, reticulated; lip white, ciliated. July. *l.* linear-lanceolate; radical ones obovate-lanceolate, obscurely-toothed; upper ones recurved. *h.* 2ft. to 3ft. Europe, 1816. Perennial. (B. M. 5999.)

D. lanata (woolly). *fl.*, corolla grey, downy, reticulated; lip white, sometimes purplish, naked; racemes dense, many-flowered; bracts shorter than the flowers. July, August. *l.* deep green, oblong, ciliated. *h.* 2ft. to 3ft. Eastern Europe, 1789. Perennial. (B. M. 1159.)

D. mariana (Sierra Morena). *fl.* rose-coloured; corolla bearded on the lower part inside with long white hairs, where they are marked with brownish-red spots. Summer. *l.* mostly radical, ovate-oblong, very downy on both sides. *h.* 1½ft. Spain. Perennial.

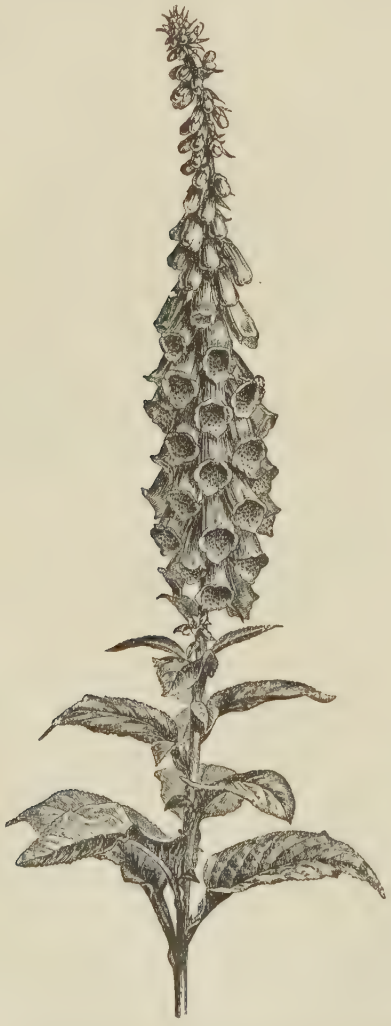


FIG. 667. UPPER PORTION OF PLANT OF DIGITALIS PURPUREA.

Digitalis—*continued.*

D. minor (smaller). A synonym of *D. dubia.*

D. ochroleuca (yellowish-white). A synonym of *D. ambigua.*

D. purpurea (purple).* Common Foxglove. *fl.* purple, marked inside with dark purple spots, which are edged with white, large, disposed in a dense terminal raceme. Summer. *l.* oblong, rugose, crenated. *h.* 3ft. to 5ft. A very handsome biennial, the colour of the flowers varying to white. Western Europe (Britain). See Fig. 667.

D. Thapsi (Thapsi). *fl.*, corolla limb purple; throat pale, marked with blood-red dots. June to September. *l.* oblong, rugose, crenated, undulated, decurrent. *h.* 2ft. to 4ft. Western Europe, 1752. Perennial. Plant tomentose, in habit much like *D. purpurea.*

DIGITARIA. Included under *Panicum.*

DIGITATE. Fingered; shaped like the open hand; when several distinct leaflets radiate from the point of a leafstalk.

DILATED. Widened.

DILATRIS (from *dilato*, to open wide; referring to the opening of the flower). ORD. *Hæmodoraceæ.* A genus of greenhouse herbaceous plants, containing a couple of species, natives of the Cape of Good Hope. Flowers purple or yellow, corymbose or panicled; perianth petaloid, externally downy, superior, six-parted, the segments erect, persistent. Leaves radical, equitant, ensiform, rigid, sheathing at the base. For culture, *see* **Anigozanthus.**

D. corymbosa (corymbose). *fl.* purple; corymb level-topped, hairy. *h.* 1ft. 1790.

D. viscosa (clammy). *fl.* blue; corymb level-topped, villous, viscid. *h.* 9in. 1795.

DILL (*Anethum graveolens*). A herb rarely grown in this country. It is used for flavouring soups, sauces, &c., for which purpose the young leaves only are required. It is of very easy culture. Seeds may be sown broadcast, or in drills, about March or April, in any ordinary garden soil; and, if the flower-stalks are allowed to remain and seed each year, plenty of plants will always be produced. The genus *Anethum* is now included, by Bentham and Hooker, under *Peucedanum.*

DILLENIA (named after John James Dillenius, a former Professor of Botany, at Oxford, author of "Historia Muscorum," and "Hortus Elthamensis.") Including *Colbertia.* ORD. *Dilleniaceæ.* A genus of less than a score species of very beautiful stove evergreen trees, with large flowers; they are only suited to places where plenty of room can be afforded. They thrive in a light sandy loam. Cuttings of half-ripened wood root readily, if inserted in sand, under a glass, in bottom heat. Seeds are sometimes imported, and are usually found to grow without much difficulty.

D. pentagyna (five-carpelled). *fl.* yellow; petals ovate-oblong, acute; pedicels one-flowered, clustered along the naked branches of the preceding year. March. *l.* oblong, villous on the nerves beneath. *h.* 20ft. India, 1803. SYN. *Colbertia coromandelina.*

D. scabrella (roughish). *fl.* yellow, fragrant; petals orbicular, or obovate; peduncles in axillary fascicles, each furnished with two opposite bracts, glabrous. *l.* elliptical, acute, 1ft. long, tapering to the base, pilose on both surfaces, with bristly serratures. Assam and Sylhet, 1820. A spreading tree.

D. speciosa (showy). *fl.* white, with yellow stamens, 9in. in diameter; peduncles one-flowered. *l.* very ornamental, elliptical-oblong, simply serrated, 6in. to 1ft. long, bright light green. *h.* 40ft. East India, 1800. One of the handsomest of Indian trees, whether the beautiful foliage is considered, or the size and structure of the flowers. In this country, however, it is a rather spreading bush. (B. M. 5016.)

DILLENIACEÆ. A rather large order of trees, shrubs, or suffruticose herbs, allied to the Magnoliads. Flowers yellow or white, often very showy, hermaphrodite or polygamous, rarely dicœcious; sepals five (rarely three, four, or numerous), persistent, in two rows; petals five, or fewer, deciduous. Fruit consisting of two or five distinct or united carpels. There are about seventeen genera and 200 species, chiefly found in Australia, India, and North America. Some are large timber trees, while others are fruit-producing. Well-known genera are: *Candollea, Delima, Dillenia,* and *Tetracera.*

DILLWYNIA (named in honour of Lewis Weston Dillwyn, a botanist whose labours were more especially directed to the British *Confervæ*; born 1778, died 1855). ORD. *Leguminosæ*. A genus of elegant greenhouse evergreen Heath-like shrubs. Flowers yellow or orange-red, few together, in axillary or terminal racemes or corymbs, rarely solitary; petals clawed. Leaves alternate or scattered, simple, narrow-linear, or terete, channelled above; stipules wanting. There are about half-a-score species, all natives of Australia. For culture, *see* **Chorizema.**

D. ericifolia (Heath-leaved).* *fl.* yellow, in very short racemes or clusters, sometimes several together, almost sessile, in a terminal leafy corymb; petals deciduous; calyx glabrous. May. *l.* numerous, rather slender, usually ¼in. to ½in. long, but sometimes twisted when dry, obtuse, with a short, recurved or straight, but scarcely pungent, point. 1794. There are various forms of this plant, which have been generally recognised as species; the following are the most prominent: *glaberrima* (B. M. 944), *parvifolia* (B. M. 1527), *pedunculatis*, *phylicoides*, and *tenuifolia*.

D. floribunda (bundle-flowered). *fl.* yellow, crowded, axillary, twin. April. *l.* crowded, subulate, mucronulate, scabrous from tubercles. *h.* 2ft. to 6ft. 1794. SYN. *D. rudis*. (B. M. 1545, under the name of *D. ericifolia*.)

D. glycinifolia (Glycine-leaved). A synonym of *Chorizema angustifolium*.

D. hispida (hairy).* *fl.* disposed in terminal heads upon numerous side shoots; corolla deep purple-red; standard and wings red. May. *l.* long, obtuse or scarcely-pointed, not twisted, and without any prominent keel. *h.* 3ft. to 6ft. SYN. *D. scabra*. (L. J. F. 296.)

D. juniperina (Juniper-leaved). *fl.*, corolla orange-coloured, with the vexillum and wings streaked in their lower part with red; heads of flowers terminal; pedicels bibracteate. March. *l.* nearly filiform, smooth, ending in a pungent point, spreading, straight, serrated. *h.* 1ft. to 3ft. 1818. (L. B. C. 401.)

D. rudis (rustic). A synonym of *D. floribunda*.

D. scabra (rough). A synonym of *D. hispida*.

DIMIDIATE. Divided into two unequal parts.

DIMORPHANTHUS (from *dimorphos*, two-formed; in allusion to there being two kinds of flowers, perfect and sterile). ORD. *Araliaceæ*. This genus is now included under *Aralia*, and the species described below is in reality merely a variety of *A. chinensis*. A very handsome hardy shrub, of erect habit, with very large, much-divided, spiny leaves. This remarkably fine foliage plant requires a sheltered, but sunny, spot, where it will fully develop its beauty. For sub-tropical gardening it is very useful. It requires similar cultivation to **Aralia** (which *see*).

FIG. 668. DIMORPHANTHUS MANDSCHURICUS, showing Flowering Branch, detached portion of Inflorescence, and single Leaflet.

D. mandschuricus (Manchurian).* *l.* from 3ft. to 5ft. long, and nearly as much in width, bipinnate, very hairy and prickly. *h.* 6ft. to 10ft. Manchuria, 1866. Deciduous. See Fig. 668.

DIMORPHISM. A state in which two forms of flower or leaf are produced by the same species.

FIG. 669. DIONÆA MUSCIPULA (see page 478).

DIMORPHOTHECA (from *dimorphos*, two-formed, and *theca*, a receptacle; disk-florets of two forms). ORD. *Compositæ*. A genus of about twenty species of smooth, hairy, or glandular annual herbs or shrubby perennials, natives of South Africa. Flower-heads long-stalked; disk orange-yellow or purplish; ray the same colours or white. Leaves radical or alternate, entire, toothed, or cut, often narrow. These half-hardy plants grow freely in well-drained loam; they are suitable for open air cultivation during summer, and for cool greenhouse in winter. The annual sorts should be sown in heat, under glass, in spring, and planted out at the end of May. The perennials are readily grown from cuttings.

D. Barberiæ (Mrs. Barber's). A purple-flowered greenhouse plant, from Caffraria, 1862. Perennial. SYN. *D. lilacina*. (B. M. 5337.)

D. chrysanthemifolia (Chrysanthemum-leaved). *fl.-heads* yellow, large, opening about eleven in the forenoon, and closing again by three or four in the afternoon. April to July. *l.* obovate, sub-lyrate, roughish. Stem suffruticose, erect. *h.* 2ft. 1790. SYN. *Calendula chrysanthemifolia* (under which name it is figured in B. M. 2218).

D. cuneata (wedge-leaved). *fl.-heads* (both disk and ray) orange. *l.* cuneate or lanceolate, coarsely toothed, nearly glabrous, gland-dotted. *h.* 2ft. to 3ft. A beautiful much-branched greenhouse shrub. SYN. *Arctotis glutinosa*. (B. M. 1343.)

D. graminifolia (grassy-leaved). *fl.-heads* 2½in. across, handsome, on long terminal peduncles; ray-florets white above, orange-brown beneath; disk-florets deep purple, dotted with the yellow of the anthers. April. *l.* linear, or linear sub-spathulate,

Dimorphotheca—*continued.*

from 3in. to 5in. long, entire or slightly toothed. Stem between herbaceous and woody, weak, terete, green, varying in length, simple or slightly branched. *h.* 1ft. to 2ft. 1861. A rather straggling plant. SYN. *Calendula graminifolia.* (B. M. 5252.)

D. lilacina (lilac). A synonym of *D. Barberiæ.*

D. Tragus (Tragus). *fl.* white, purple, opening in the morning and closing again in the afternoon. May, June. *l.* linear, somewhat toothleted, muricate, dotted beneath. Stem suffruticose. *h.* 2ft. 1774. SYN. *Calendula Tragus* var. (under which name it is figured in B. M. 1981).

DINETUS. *See* **Porana.**

DIŒCIOUS. When a plant bears female flowers on one individual, and males on another.

DIONÆA (from Dionæa, a surname of Venus, as the supposed daughter of Jupiter and Dione). ORD. *Droseraceæ.* A dwarf, exceedingly interesting, herbaceous perennial. It thrives in a mixture of peat and living sphagnum. The pot containing it should be placed in a pan of water, and stood near the glass in the greenhouse, or even in a cold frame. Propagated by division of the plant, or sometimes by seed.

D. muscipula (fly-catcher).* Venus's Fly-trap. *fl.* white, in terminal corymbs. July and August. *l.* radical, on long footstalks, which are dilated at the top into a two-lobed irritable limb, beset with one row of long hairs on the margin, folding together, in the manner of the teeth of a trap. *h.* 3in. to 6in. Carolina and Florida, 1768. The seat of irritation resides in the three bristles which are placed in the centre of each lobe; on these being touched, movement immediately takes place. See Fig. 669, page 477. (B. M. 785.)

DIOON (from *dis*, two, and *oon*, an egg; in reference to each scale bearing two ovules; otherwise from the seeds being borne in twos). SYN. *Platyzamia.* ORD. *Cycadaceæ.* A very singular genus containing a couple of species, both natives of Mexico. They make noble objects in a collection of ornamental-leaved plants. Dioons thrive best in a compost of good loam and river sand, and succeed well in an ordinary greenhouse, except when in a growing state, at which period they should have the warmth of a stove. Propagated by seed, which are very large. Miquel observes that this genus is more closely allied to certain fossil *Cycadaceæ* than is any other living representative of the order.

D. edule (edible).* *l.* glaucous-green, pinnate, from 3ft. to 6ft. in length, and 6in. to 7in. in breadth, tapering towards the base, where they are clothed with short white woolly hairs; texture very firm. Stems about 3ft. in circumference. *h.* 3ft. 1844. (B. M. 6184.) The fruit of this plant is as large as a chestnut, and is powdered by the natives, and formed into a kind of arrowroot.

FIG. 670. DIOSCOREA BATATAS.

DIOSCOREA (named after Dioscorides, a native of Anazauba, in Cilicia, who lived in the age of Nero; his celebrated book upon medicinal herbs was the foundation of almost all botanical knowledge until modern times). Yam. ORD. *Dioscoreaceæ.* Very ornamental-leaved (with few exceptions) stove herbaceous climbers, with large tuberous roots, admirably adapted as trellis or pillar plants. Flowers whitish or yellowish, inconspicuous. Leaves broad, cordate, or angular.

Dioscorea—*continued.*

In the winter months, Dioscoreas should be kept in a cool (but not cold) place, either in the pots or in some perfectly dry sand. The most suitable soil is a rich light compost, formed of turfy loam and well-decomposed manure, in about equal parts. They should have abundance of root room, and be liberally supplied with water during the growing season, gradually diminishing the quantity as the shoots show signs of decay. Propagated by divisions of the tubers, which may be effected either in autumn or spring, while they are at rest, but never when growing.

D. Anœctochilus (Anœctochilus-like). *l.* deep olive-green, beautifully marbled with gold, with a central band of the same colour, broadly acuminate; when young, they are of a uniform plain bright green. South America, 1865.

D. argyræa (silvery). *l.* green, cordate, about 5in. across, seven-nerved; nerves bordered with distinct irregular angular patches of silvery-grey. Columbia.

D. Batatas (Batatas).* Chinese Yam. *fl.* white, diœcious, very small, in axillary racemes, generally sterile. *l.* deep green, very glossy, opposite, cordate, acuminate. Stems annual, smooth, green or purplish, sometimes attaining a height of from 6ft. to 9ft. The roots are used like potatoes—boiled, roasted, and cooked in various other ways. Probably the great depth to which the tubers descend, and the consequent expense of harvesting the crop, has prevented this useful hardy vegetable from being much cultivated in this country. See Fig. 670.

D. bulbifera (bulb-bearing).* *fl.* greenish, disposed in gracefully drooping racemes. *l.* broad, cordate. East Indies, 1692. A very old inhabitant of our stoves, and at one time strongly recommended as a substitute for the potato. (G. C. n. s., viii. 48.)

FIG. 671. TUBERS OF DIOSCOREA DECAISNEANA.

D. Decaisneana (Decaisne's). Decaisne's Yam. *l.* very light green, opposite or alternate, deeply cordate at base, regularly narrowed to the apex. Tubers in some cases smooth and regularly shaped, as in some varieties of potato, others very irregular. China, 1862. Perhaps this is a variety of *D. Batatas*, from which it, however, differs a good deal in the tubers not being developed at such a great depth underground. See Fig. 671.

D. discolor (two-coloured). *l.* beautifully mottled with two or three shades of green, large, cordate; under surface rich purplish-crimson. Tropical America.

D. illustrata (illuminated). *l.* satiny-green, marked by fine transverse whitish parallel lines between the nerves, with an irregular central band of silvery-grey, and a few angular patches of the same colour, generally placed in juxtaposition with the ribs; about 6in. long. produced at the base into two bluntish lobes; under surface purple. Brazil, 1873. (G. C. 1873, 1730.)

D. multicolor (many-coloured).* *l.* rich green, beautifully spotted and variegated with pale spots and blotches, most numerous near the principal veins; cordate, 3in. to 5in. long, and 2½in. to 3in. wide; under surface pale lurid purple. Rio Negro, 1868. (I. H. 1871, 53.) There are about half-a-dozen varieties of this species known, of which the following are in cultivation: *chrysophylla*, leaves olive-brown, variegated with yellow; *Eldorado*, leaves satiny-green, with silvery-grey central band, and irregular blotches of the same colour; *melanoleuca*, leaves deep green, with central silvery band and silvery blotches along the veins; *metallica*, leaves bronzy, with coppery central band.

D. nobilis (noble). *l.* velvety-bronze, variegated with yellow. Brazil, 1868.

D. retusa (retuse). *fl.* dull yellowish; racemes axillary, slender, pendulous, many-flowered. *l.* alternate, loosely scattered, digitate; leaflets five to seven, petiolulate. South Africa, 1870. (G. C. 1881, xv. 511.)

D. sativa (cultivated). Common cultivated Yam. *l.* alternate, cordate, round, ovate, cuspidate; lobes of base close together. Stem smooth, round, slender. West Indies, 1733.

D. vittata (striped). *l.* flushed with claret-colour beneath, or variegated with red and white on both sides, large, cordate. (B. M. 6409.)

DIOSCOREACEÆ. A natural order of twining shrubs or herbs, found chiefly in tropical countries. Flowers in spikes, small; perianth of males six-cleft; lobes in two rows, herbaceous and adnate; stamens six, inserted in the base of the perianth. Female flowers with a six-cleft or six-partite perianth; staminodes small, three to six. Most of the Dioscoreas produce tubers (known as Yams), which are used as food, in the same way as potatoes. *Dioscorea* is the typical genus. The order is represented in Britain by the Black Bryony, *Tamus communis*.

DIOSMA (from *dios*, divine, and *osme*, smell; well-bruised leaves have an exquisite smell). ORD. *Rutaceæ*. A genus of about a dozen species of small greenhouse Heath-like shrubs, all natives of South Africa. Flowers white or reddish, terminal, sub-solitary or corymbose; calyx five-parted; petals sessile, obovate, longer than the calyx. Leaves alternate or opposite, linear-acute, channelled, serrulated or ciliate, gland-dotted. Diosmas may be very easily raised from cuttings, inserted in sandy peat, covered with a bell glass, and placed in very gentle heat. They will soon root, and may then be transferred singly into thumb pots, and afterwards, by successive stages, into larger ones. It will be desirable to keep the plants a little in shape by stopping the most vigorous branches, thus causing a lateral growth. Diosmas succeed in fibry peat and sand, and also in the same compost, with the addition of a little fibrous loam.

D. ericoides (Heath-like).* *fl.* white, with a tinge of red on the upper surface, small, terminal, two or three together. February to July. *l.* crowded, trigonal, blunt, smooth, dotted, emitting a strong penetrating smell when bruised. *h.* 1ft. to 3ft. 1756.

FIG. 672. FLOWERING BRANCH OF DIOSMA VULGARIS.

D. vulgaris (common). *fl.* white, tinged with blue; corymbs terminal, few-flowered. May. *l.* scattered, linear, pointed, long, smooth, glandular, spreading, fringed. *h.* 1ft. to 3ft. See Fig. 672. (B. M. 2332, under name of *D. ericoides*.)

The other species are rarely seen in cultivation.

DIOSPYROS (the old Greek name used by Theophrastus, from *dios*, divine, and *puros*, wheat; literally celestial food). Date Plum. ORD. *Ebenaceæ*. A genus of about 150 species of stove, greenhouse, or hardy trees and shrubs, represented in nearly all temperate and tropical regions. Flowers inconspicuous, polygamous, axillary. Leaves simple, alternate, entire, exstipulate. The greenhouse species are ornamental, and thrive under ordinary treatment; they are propagated by cuttings of half-ripened shoots. Those requiring stove heat strike best from ripened shoots, made during April or May, placed in sand, and in a brisk bottom heat. The hardy species may be increased by seeds.

Diospyros—*continued.*

D. Ebenus. Ebony. *fl.* white; male ones sub-racemose; hermaphrodite ones solitary. *l.* bifarious, ovate-lanceolate or oblong, acuminated, glabrous. *h.* 30ft. to 40ft. 1792. Stove. (B. F. S. 65.)

FIG. 673. FRUIT AND LEAVES OF DIOSPYROS KAKI.

D. Kaki (Kaki).* *fl.* whitish-green; male peduncles usually three-flowered. *fr.* yellow when ripe, globose, eight-celled, size of a small orange, abounding in yellow, fleshy, edible pulp; it is tolerably pleasant. *l.* bifarious, ovate-elliptic, acuminated, elliptic-oblong or obovate, cordate at the base, downy on both surfaces. Branches tomentose. *h.* 12ft. to 20ft. China, 1789. Hardy in South of England and Channel Islands, &c. See Fig. 673. The variety *costata* (G. C. n. s., iv. 777) is so named in consequence of the depressed lines or ribs that mark the surface of the fruit from the apex down towards the enlarged persistent four-lobed calyx at the base. The name of Date Plum is, perhaps, more frequently used for this species than for any of the others.

D. Lotus.* European Lotus, or common Date Plum. *fl.* reddish-white, small. July. *fr.* yellow when ripe, sweet with astringency, size of a cherry. *l.* oblong, acuminate, of a beautiful dark glossy green above; when mature, and exposed to the air, they assume a purplish hue beneath; they do not change colour in autumn, but drop off simultaneously with the first attack of sharp frost. *h.* 20ft. to 30ft. South Europe, Orient, 1596. Hardy.

D. Mazeli (Mazel's).* *fr.* orange-red, large, spherical, ripe in November. *l.* elliptic-ovate or sub-cordate, deciduous. Japan, 1874. (R. H. 1874, 70.)

D. virginiana (Virginian).* Persimmon; Virginian Date Plum. *fl.* pale yellow. July. *fr.* golden-yellow, size and form of a common Plum. *l.* ovate-oblong, acuminated, glabrous, shining above, and paler beneath, reticulately veined; petioles short and curved, and, as well as the branchlets, downy. *h.* 20ft. to 30ft. North America, 1629. Hardy.

DIOTIS (from *dis*, two, and *ous*, *otos*, an ear; alluding to the ear-like lobes of the corolla). Cotton Weed. ORD *Compositæ*. A very ornamental hardy perennial, with a white and cottony aspect. It forms an excellent edging or rockery plant, and is increased by cuttings or seeds.

D. candidissima (whitest). A synonym of *D. maritima*.

D. maritima (sea).* *fl.-heads* yellow, sub-globose, discoid. *l.* alternate, oblong, entire or toothed, densely covered with white felted wool. Rootstock creeping, woody. *h.* 6in. to 1ft. South of England (rare), shores of the Mediterranean and the Canaries. SYN. *D. candidissima*. (Sy. En. B. 725.)

DIPCADI (derivation obscure). SYNS. *Polemannia*, *Tricharis*, *Uropetalum*, and *Zuccagnia*. ORD. *Liliaceæ*. A genus of pretty hardy and half-hardy bulbs, allied to *Galtonia*. There are about a score of species, natives of South Europe, tropical and Southern

Dipcadi—*continued.*

Africa, and East Indies. Flowers greenish or yellowish; raceme simple, sparsely flowered; pedicels short, bracteate at base. They require a compost of light sandy loam and leaf mould; the roots must be kept dry during winter. Propagated by offsets, in spring.

D. Balfourii (Balfour's). *fl.* greenish-yellow, nearly 1in. long; racemes loosely ten to twelve-flowered, 6in. to 9in. long; scape green, terete, 2ft. to 3ft. long. September. *l.* three to four, ensiform, sub-erect, about 1ft. long and 1in. broad. *h.* 2ft. Socotra, 1880.

D. glaucum (grey-leaved). *fl.*, corolla of a greenish tawny colour, glaucous or clouded with a grey bloom or hoar on the outside, almost 1in. long, tubularly campanulate; segments oblong, obtuse; raceme long, spiked, many-flowered, irregularly and distantly scattered; scape upright, scarcely flexuose, 2ft. to 3ft. high; peduncles straight, two or three times longer than the flower. August. *l.* upright, lorately oblong, lanceolate, glaucous, like the rest of the plant, flat, convolute, and sheathing at their base. *h.* 2ft. to 3ft. Cape of Good Hope, 1814. SYN. *Uropetalon glaucum* (under which name it is figured in B. R. 156).

D. serotina (late-flowering). *fl.* brown-coloured; racemes many-flowered; scape bending; corolla cernuous, cylindric-campanulate, six-partite for more than three-fourths of the length; segments linear-oblong, equal; outer ones acute, patent; inner more obtuse, partly coherent. June. *l.* nearly the length of the scape, alternately linear, channelled. *h.* 9in. Spain. SYN. *Scilla serotina* (under which name it is figured in B. M. 859). There is a variety of this with pinkish flowers, *D. s. fulvum* (figured in B. M. 1185).

D. umbonatum (umbonate). This species is closely allied to *D. Welwitschii*, but differs from that by its smaller and differently-shaped bulb, larger bracts, more numerous and shorter flowers, and differently-shaped ovary. Cape of Good Hope, 1865. SYN. *Uropetalum umbonatum.* (Ref. B. 17.)

D. Welwitschii (Welwitsch's). *fl.* green throughout, at first cernuous, finally erecto-patent, the inner segments of the perianth connate at the edges, shortly patulous at the tips, the outer segments reaching down within ¼in. of the base, the outer third reflexed, the tip cylindrical; raceme secund, four to six-flowered, 3in. to 4in. long; scape 1ft. long, erect, slender, terete, glaucous-green, naked. *l.* linear, about two lines broad, equalling or slightly exceeding the scape, sheathing it at the base, flat upwards, recurved, fleshy in texture, minutely ribbed, glaucous-green, naked. *h.* 1ft. Angola, 1867. This species succeeds well if grown exposed to the light in a cool greenhouse. SYN. *Uropetalum Welwitschii.* (Ref. B. 16.)

DIPHACA. *See* **Ormocarpum.**

DIPHYLLEIA (from *dis*, double, and *phyllon*, a leaf; in allusion to each stem of the plant bearing only two alternate leaves). ORD. *Berberideæ*. A pretty hardy herbaceous perennial. It thrives best in peat borders and edges of beds of American plants, in moist spots. Propagated by divisions, in spring.

D. cymosa (cymose).* Umbrella Leaf. *fl.* white, disposed in large loose heads or cymes. Summer. Berries blue, roundish. *l.* two, alternate, large, kidney-shaped, usually profoundly lobed at the apex. *h.* 1ft. North America, 1812. (B. M. 1666.)

DIPHYSA (from *dis*, twice, and *physa*, a bladder; in reference to the legume, which is furnished with a large membranous bladder on each side). ORD. *Leguminosæ*. A genus containing four species of ornamental stove evergreen trees or shrubs, often glandular, all natives of Central America. The soil best adapted to them is one composed of sandy loam and fibry peat. Propagated by cuttings, made from young shoots, and placed in sand, in a mild bottom heat.

D. carthagenensis (Carthagenian). *fl.* yellow; peduncles axillary, two to three-flowered. *l.* impari-pinnate; leaflets five pairs. *h.* 6ft. to 10ft. Carthagena, 1827. A small unarmed tree.

DIPLACUS (from *dis*, two, and *plakos*, a placenta; placenta separated into two parts). ORD. *Scrophularineæ*. A genus of half-hardy evergreens, now referred to *Mimulus*, from which it differs in the plants being more woody at the base.

DIPLADENIA (from *diploos*, double, and *aden*, a gland; referring to the presence of two gland-like processes on the ovary). ORD. *Apocynaceæ*. Very ornamental stove evergreens. Flowers usually rose or purple, showy. Leaves opposite, entire. Among stove twiners, there are few more deserving of general cultivation than these, as the large flowers of some of the species and

Dipladenia—*continued.*

hybrids are unrivalled for brilliancy of colour, especially if the plants are allowed free root room, in a prepared border. They are also well adapted for exhibition purposes, in which case it will be necessary to cultivate in large pots, to admit of removal. When in flower, and well grown, Dipladenias, in either of these positions, must be classed amongst the most beautiful of stove plants.

Propagation is effected by cuttings of the young shoots that are produced when the plants commence new growth, in spring. These, or single eyes, should be inserted in a compost of equal parts sand and peat, covered with a bell glass, and placed in a brisk bottom heat. Roots will soon be emitted, and the young plants may then be transferred to separate pots, grown on, and shifted into larger sizes as required.

After-Cultivation. This will consist chiefly in supplying plenty of heat and moisture in the early part of the season, and in thoroughly ripening the main growths in autumn for the succeeding year. A suitable compost is fibry peat, broken up roughly for use, with sufficient silver sand added to insure the free passage of water. Drainage must also be efficient, as few flowering subjects show the effects of a waterlogged soil quicker than do these. Young plants should be grown on without stopping, and be supported by a stake until of sufficient size to be placed on a trellis. This is best made of small galvanised wire, and a conical or globular form is most suitable. If intended for planting out, to train on the roof of a stove—a position best suited for showing the flowers of Dipladenias—the trellis will be unnecessary, as the plants may be trained upright until established, and then placed out permanently. If a little bottom heat can be obtained, it will be of material assistance. The flowers are produced in profusion all the latter part of the summer, on the wood of the current year. Nearly all this should be removed when the flowering season is over, unless required for main shoots to cover the trellis. Dipladenias should be kept warm and in a moderately dry condition when at rest in winter, gradually introducing more moisture to start them in spring. Plenty of heat and frequent syringings, in early summer, will encourage the production of good flowering wood. The plants are subject to the same insect pests as many others grown in the high temperature of a stove. When insects are detected, sponging the leaves and stems will prevent their increase, and is the best method of destruction.

D. amabilis (lovely).* *fl.* rosy-crimson, borne in clusters, very large, 4in. to 5in. in diameter; petals very round and stiff. May to September. *l.* shortly stalked, oblong-acute. *h.* 10ft. A very fine hybrid between *D. crassinoda* and *D. splendens*. (F. M. 309.)

D. amœna (pleasing).* *fl.* pink, suffused with rose, somewhat resembling *D. splendens*, but much finer; petals round, stiff, and not reflexed. *l.* oblong-acuminate. Garden variety. This valuable plant flowers as freely as *D. amabilis*, and has better foliage than that plant.

D. boliviensis (Bolivian).* *fl.* white, about 2in. across, with a golden-yellow throat; racemes sub-terminal or axillary, three or four-flowered. *l.* oblong, acuminate. Stems slender. Bolivia, 1866. A very pretty small growing species. (B. M. 5783.)

D. Brearleyana (Brearley's).* *fl.* opening pink, and changing to the richest crimson, very large. *l.* opposite, oblong, acute, dark green. A garden hybrid, of great beauty, and of the most floriferous character.

D. carissima (choicest).* *fl.* of a soft delicate blush-pink, with an open throat, marked opposite the centre of the oblique limb-segments by radiating lines of bright rose, about 5in. in diameter. Garden variety. See Fig. 674, for which we are indebted to Mr. Wm. Bull. (F. & P. 1879, 502.)

D. crassinoda (thick-jointed). *fl.* rose-coloured, of a very lovely shade. *l.* oblong-lanceolate. *h.* 10ft. Rio Janeiro. An old and well-known stove plant, now superseded by more showy sorts. SYN. *D. Martiana.* (B. R. 30, 64.)

D. c. Houtteana (Houtte's). An improved variety of the preceding, with beautiful rose-coloured flowers, having an orange-coloured throat.

D. delecta (choice). *fl.* of a very pretty shade of rosy-pink, finely formed, and of good substance; mouth encircled with deep

Dipladenia—*continued.*

rose and shaded with violet, and the light throat shaded with yellow. Garden variety.

D. diadema (diadem).* *fl.* of a soft pink colour, suffused with rose, the mouth encircled with deep rose, of large size and excellent form. Garden variety.

D. Harrisi (Harris's). A synonym of *Odontadenia speciosa.*

D. hybrida (hybrid).* *fl.* of a flaming crimson-red, freely produced. *l.* large, stout, bright green. A beautiful garden variety, but rarely seen.

D. insignis (remarkable).* *fl.* rosy-purple, bold. A stout-growing garden variety, with very strong foliage. See next page, Fig. 675, for which we are indebted to Messrs. Veitch and Sons.

Dipladenia—*continued.*

A species with broad foliage and stout shoots. SYN. *Echites splendens.* (F. d. S. 1, 30.)

D. s. profusa (profuse).* *fl.* rich carmine, 5in. in diameter, produced abundantly in bunches from the axils of the leaves, and lasting a long time in perfection. *l.* oblong, acuminate. Garden variety.

D. s. Williamsi (Williams's). *fl.* with a deep pink throat. Raised from *D. splendens*, on which it is a decided improvement, flowering more freely.

DIPLAZIUM. *See* **Asplenium.**

DIPLECTHRUM. A synonym of **Satyrium** (which *see*).

FIG. 674. FLOWERING BRANCH OF DIPLADENIA CARISSIMA (see page 480).

D. Martiana (Martius's). A synonym of *D. crassinoda.*

D. nobilis (noble).* *fl.* changing from rosy-purple to orange-red, large. A very handsome, free-growing, garden variety. (G. C. 1847, 748.)

D. ornata (adorned). *fl.* of a rich crimson colour, beautifully suffused with violet, large. Garden variety.

D. Regina (Queen).* *fl.* blush on first opening, and afterwards changing to a most delicate flesh-colour, the throat being suffused with rose. An early-flowering variety, of neat growth and remarkably free habit.

D. rosacea (rosy). *fl.* soft rosy-pink, suffused here and there, and also bordered, with a deeper and richer shade of the same colour; throat yellow, marked with a bright rose ring at the mouth. Garden variety.

D. splendens (splendid). *fl.* white, suffused with pink, borne on spikes that keep on extending for months. Organ Mountains.

DIPLOCHITA. Included under **Miconia** (which *see*).

DIPLOCOMA. *See* **Heterotheca.**

DIPLODIUM. A synonym of **Pterostylis.**

DIPLOGASTRA. A synonym of **Platylepis.**

DIPLOLÆNA (from *diploos*, double, and *chlaina*, a cloak; alluding to the double involucre). ORD. *Rutaceæ.* A genus of about four species of greenhouse evergreen Australian shrubs. Flower-heads terminal, shortly pedunculate or nearly sessile. Leaves alternate, petiolate, entire. Diplolænas thrive in a compost of peat and a little fibry loam. Propagated by cuttings of firm young shoots.

D. Dampieri (Dampier's). *l.* green and glabrous above. Otherwise closely resembling *D. grandiflora.* (B. M. 4059.)

Diplolæna—*continued.*

D. grandiflora (large-flowered). *fl.-heads* shortly pedunculate, 1½in. in diameter; petals linear, ciliate, concealed within the head. April. *l.* ovate or broadly oblong, very obtuse, 1in. to 2in. long, hoary-tomentose, especially beneath. *h.* 4ft. to 5ft.

DIPLONEMA. *See* **Euclea.**

DIPLOPAPPUS. Most of the plants formerly placed here are now included under **Aster** (which *see*).

Diplothemium—*continued.*

and one of sand. Increased by seeds. These Palms have been recommended for sub-tropical gardening, for which purpose, if well hardened off, they form excellent subjects.

D. caudescens (stemmed).* *l.* 2ft. to 6ft. in length, pinnate; pinnæ from 1½ft. to 2ft. in length, about 1in. broad, with a bifid point, somewhat clustered together; upper surface dark shining green, of a very beautiful silvery-whiteness beneath.

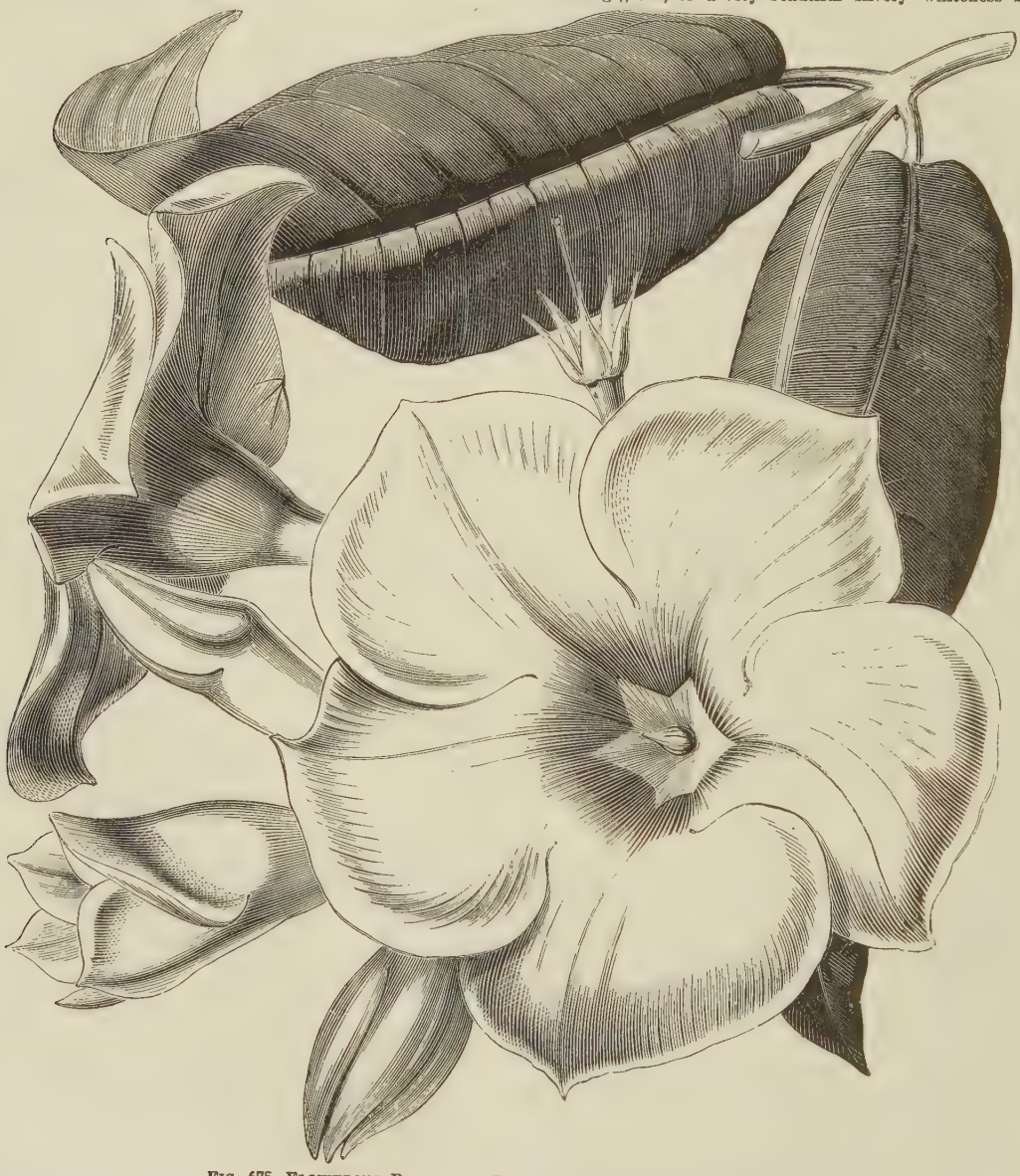


FIG. 675. FLOWERING BRANCH OF DIPLADENIA INSIGNIS (see page 481).

DIPLOSTEMONOUS. With twice as many stamens as petals or sepals.

DIPLOTHEMIUM (from *diploos*, double, and *thema*, a sheath). ORD. *Palmæ.* Very noble Palms, either almost stemless, or developing a short ringed trunk. Flowers monœcious, rather large. Leaves pinnate, with linear segments, silvery-white underneath. They thrive in a compost of two parts rich loam, one of peat, *h.* 10ft. Brazil, 1847. Described as being one of the handsomest palms in cultivation. SYN. *Ceroxylon niveum.*

D. maritimum (sea). *l.* pinnate, with a more ovate outline than the foregoing; the pinnæ are also closer together, 10in. to 12in. in length, and about 1in. broad; deep green above, silvery-grey below. *h.* 10ft. Brazil, 1823.

The other two species are: *campestre* and *littorale.*

DIPSACEÆ. An order of biennial or perennial herbs, natives of nearly all temperate countries. Flowers

Dipsaceæ—*continued.*

in heads, surrounded by an involucre; calyx limb superior, cup-shaped, entire, lobed, or ciliate, membranous, sometimes surrounded by a separate involucel; corolla funnel-shaped or cylindric, often curved; lobes four or five, obtuse, imbricate in bud; stamens four, inserted on the corolla tube. Leaves opposite or rarely verticillate, exstipulate. There are five known genera, including *Cephalaria*, *Dipsacus*, and *Scabiosa*, and about 125 species.

DIPSACUS (the Greek name used by Dioscorides, from *dipsao*, to thirst; probably in consequence of the connate leaves holding water). Teazel. Ord. *Dipsaceæ*. Erect, pilose, or prickly, hardy biennial herbs. Flower-heads terminal, oblong-ovate or roundish. Leaves opposite, usually connate at the base, toothed or jagged. These singular plants are best suited for the wild garden, or rough parts of the flower border. They thrive in almost any ordinary garden soil, and may be easily raised from seed. There are about twelve species, the undermentioned being only those that are worth growing.

D. Fullonum (fuller's). Fuller's Teazel. *fl.-heads* whitish, with pale purple anthers; leaves of involucre spreading, shorter than the ovoid heads. July. *l.* connate at the base, oblong-lanceolate, serrated; upper ones entire. Stem prickly. *h.* 4ft. to 6ft. The specific name of the plant is derived from the fact that its heads are used by the fuller in dressing cloth. This is believed by some to be but a cultivated variety of *D. sylvestris*, differing only in the scales of the receptacle being hooked at the extremity.

D. laciniatus (cut-leaved). *fl.-heads*, corollas whitish; anthers reddish; leaves of involucre slightly erect, stiffish, usually shorter than the ovoid head. July. *l.* connate at the base, sinuately jagged, and the lobes sinuately toothed; downy beneath. Stem prickly. *h.* 3ft. to 5ft. Europe and Siberia, 1683.

D. sylvestris (wood). Common Teazel. *fl.-heads* pale lilac; leaves of involucre inflexed, weak, longer than the ovate-oblong heads of flowers. July. *l.* connate at the base, ovate-lanceolate, acuminated, toothed. Stem prickly. *h.* 6ft. Europe (Britain).

DIPTERACANTHUS. This genus is now referred to **Ruellia** (which *see*).

DIPTEROCARPEÆ. An order of resin-bearing trees, all the species of which are found in the tropics of the Old World. Flowers often sweet-scented, disposed in axillary panicles. Leaves alternate, involute; stipules convolute. There are a dozen genera, perhaps the best known being *Dipterocarpus* and *Dryobalanops*.

DIPTEROUS. Having two wing-like processes.

DIPTERYX (from *dis*, double, and *pteryx*, a wing; in reference to the two upper lobes of the calyx, which appear like two wings). Tonquin Bean. Syn. *Baryosma*. Ord. *Leguminosæ*. A genus of about eight species of stove evergreen trees. Flowers violet or rose, disposed in terminal panicles. Leaves opposite or alternate, abruptly pinnate. They thrive in rich, rough, loamy soil. Cuttings will strike if inserted in sand, and a hand glass placed over them, in a moist heat. None are of any importance, except from an economic standpoint; they are useless as garden plants.

D. odorata (sweet-scented). *fl.* purple, dashed with violet, disposed in racemose panicles. *l.* alternate; leaflets five or six, alternate; petioles margined. *h.* 60ft. Guiana, 1799. The seeds of this tree are the Tonga or Tonquin Beans, well known as giving a grateful scent to snuff.

DIRCA (from *dirke*, a fountain; referring to the plant growing in moist places). Ord. *Thymeleæ*. A genus of a couple of species of hardy, deciduous, branchy shrubs, with the habit of miniature trees. Both are natives of North America, and the one in cultivation thrives well in a moist peaty soil. Increased readily by imported seeds, or by layers.

D. palustris (marsh).* Leather-wood. *fl.* yellowish, terminal, preceding the leaves. March. *l.* lanceolate, oblong, alternate, pale green, villous beneath. *h.* 2ft. to 5ft. 1750. (B. R. 292.)

DISA (derivation unknown; probably a native name). Ord. *Orchideæ*. A genus of about fifty species of terrestrial Orchids, natives of tropical and South Africa, and the Mascarene Islands. All are very pretty and

Disa—*continued.*

interesting, but the number worth cultivating is somewhat limited. Of these, the best is *D. grandiflora*, sometimes known as the Flower of the Gods. Its culture, though considered by many to be difficult, is comparatively easy, where proper means and site are employed. With regard to its native surroundings, it should be borne in mind that the streams, &c., upon or near the margins of which it grows, are water gorges during some portion of the winter months, and occasionally very dry in the summer. The plants should be kept quite cool in winter, but not allowed to become too dry at any time. By the end of February, more water should be given; and from April until the flower-spikes are formed, too great a quantity cannot well be applied. *D. grandiflora* is one of the most beautiful of cool Orchids, succeeding in an admixture of peat and sphagnum. The plants should be somewhat elevated in potting. Careful ventilation, avoiding draughts, is essential.

With regard to the best method of raising *D. grandiflora* from seed, the Rev. F. Tymons, of Dublin, says: "The seed should be sown as soon as it is ripe; but if that does not happen till late in the autumn, it would be safer to postpone the sowing until the following September, or the last week of August. There are two methods of sowing the seed, each of which has its advocates. One of them consists in sowing on living sphagnum, in a pot or pan. The moss must always be kept moist, which may be effected by constant and gentle dewings, as the danger of regular watering, as ordinarily understood, is that the seed would be washed down too deeply. The other plan is to sow on a sod of turf . . . . or hard peat . . . . I mean the peat as prepared for fuel. Let it be well soaked in water, and the seed sown thickly on its upper surface. Cover all with a bell glass, and place it in a cool, damp, and shady place. The turf must never become dry, but the spraying of water must be of the gentlest description. A good plan for watering very fine seed is to dip a stiff-haired brush in water, and to draw the hand briskly against it, at such a distance as that only the finest dew reaches the seed. When the seedlings appear, they must have more air. As soon as they can be handled, they should be pricked off into small pans, or into pots, not less than 4in. in diameter. The compost for the seedlings, for the first two years, should be somewhat similar to that for mature plants, only that the peat should be considerably finer for an inch or two on the surface, and a much larger proportion of silver sand is necessary. The after-treatment, as regards ventilation, situation, and water, is similar to that for established plants." The same writer warns "persons whose stock is limited to a plant or two, not to be too anxious for seed. One pod on a healthy plant is quite sufficient, as seeding retards the autumn growth and recovery, after the labour of flowering."

D. cornuta (horned-flowered). *fl.* green, white, and purple, moderately large; spikes 4in. to 6in. long, many-flowered; sepals dissimilar; petals small, oblong, decurved and falcate, with a broad auricle at the base; lip small, spathulate, green, with a large black velvety spot. December. *l.* lanceolate, erect or erecto-patent, acuminate, the lower ones sheathing at the base, and there marked with red spots, the uppermost sessile. Stem green, spotted with red, leafy to the summit. Cape of Good Hope, 1843. (B. M. 4091.)

D. grandiflora (large-flowered).* *fl.* light rose, scarlet, and gold. June and July. *l.* stem-clasping, alternate, dark green, shining. Stems 2ft. to 3ft. high, four or five-flowered. Table Mountain, 1825. (B. M. 4073.)

D. g. Barrellii (Barrell's).* *fl.* orange-scarlet; lip a lighter shade of the same colour, with crimson veins. 1874. (Gn., Feb. 1882.)

D. g. superba (superb). *fl.* bright scarlet and crimson, veined with pink, over 4in. in diameter. June and July. Stems 1½ft. to 2ft. high, two to eight-flowered. A very handsome form. (Gn., Feb. 1882.)

D. macrantha (large-flowered). A garden synonym of *D. megaceras*.

D. megaceras (great-horned).* *fl.* white, blotched inside with pale

Disa—*continued.*

purple, large; upper sepal (hood) conical, with an oblique mouth, acute above, slightly curved, undulate; lateral sepals decurved, oblong-lanceolate, with a short recurved spur behind the tip; petals broadly obovate; lip narrowly tongue-shaped, with a revolute tip, glabrous, smooth. August. *l.* lanceolate, long-acuminate, concave. Stems 1ft. to 2ft. high, robust, leafy. *h.* 1ft. to 2ft. South Africa, 1880. SYN. *D. macrantha*, of gardens. (B. M. 6529.)

D. polygonoides (Polygonum-like). *fl.* orange-yellow, or light red or scarlet; spikes very many-flowered; dorsal sepal erect, oblong, sub-acute, very concave, cymbiform, spurred at the base behind; petals much smaller than the sepals, erect, and partially concealed by the upper sepal, linear-oblong, tip obtuse and incurved; lip strap-shaped, smooth, flat or convex, obtuse or sub-acute, slightly constricted above the base. September. *l.* linear-lanceolate, or almost strap-shaped, gradually narrowed to the acuminate point, nearly flat. Stem tall, stout. *h.* 1ft. to 2ft. Natal, 1879. (B. M. 6532.)

DISANDRA. A synonym of **Sibthorpia** (which *see*).

DISBUDDING. By this term is meant the removal of superfluous buds, flowers, or shoots, in the early stages of growth, from fruit or other trees, in order to divert the sap into those which are stronger, and required to remain either for the production of branches, flowers, or fruits of superior quality. It is of necessity very largely practised with fruit-trees, under glass, that have to be kept within a limited area, and where the crop of fruit and continued vigour of the trees are annually matters of very great importance. The branches of Figs, Peaches, and Vines, amongst many others, are each year so full of young shoots in spring, or at other seasons, when started into growth, that if all were allowed to remain, the result would be a dense thicket of useless branches. Disbudding should always be performed with judgment, and only by those who understand it, as irreparable damage may easily be caused by the uninitiated. The operation should be commenced as soon as the young buds or shoots are large enough to pinch out with the finger and thumb, and the process should be frequently repeated, rather than remove too much at a time. Many plants may, with advantage, be disbudded occasionally to thin the branches, for admitting more light and air, or for inducing a more compact habit. Disbudding of flowers, where crowded, if carefully performed when in an early stage, may also be recommended in some cases.

DISCARIA (from *diskos*, a disk; the disk being large and fleshy). SYN. *Tetrapasma*. ORD. *Rhamneæ*. An interesting genus of about thirteen species of spiny shrubs. One is a native of Australia, another of New Zealand; all the rest are extra-tropical South American. They are closely allied to **Colletia** (which *see* for culture).

D. australis (Southern). *fl.* yellow; racemes short, many-flowered, rising from beneath the spines. May. *l.* few, opposite, obovate, minute, quite entire, pubescent. Branches almost leafless, pubescent; branchlets simple, spiny. *h.* 2ft. Australia, 1824. A greenhouse evergreen. SYN. *Tetrapasma juncea.*

D. serratifolia (saw-leaved).* *fl.* greenish-white, in axillary tufts, very fragrant. June. *l.* opposite, shining, bright green. *h.* 6ft. to 10ft. Branches green, like those of a broom, spiny. A capital subject for pot culture, or as a plant for a conservatory wall. (G. C. n. s., vi. 324.) SYN. *Colletia serratifolia.*

D. Toumatou (Toumatou). Wild Irishman. *fl.* white, ¼in. in diameter, apetalous; pedicels and calyx minutely downy; calyx tube short, obscure; lobes four or five, broadly ovate; disk broad, with a narrow upturned edge. June. *l.* small, fascicled, in the axils of the spines, absent in old plants, linear or obovate-oblong, obtuse or retuse, smooth or pubescent, quite entire or serrate. *h.* 15ft., in sub-alpine localities. New Zealand, 1875. Greenhouse.

DISCHIDIA (from *dischides*, twice-cleft; referring to the bifid segments of the corona). ORD. *Asclepiadeæ*. A genus of stove evergreen perennial trailers. There are about twenty-four species, natives of the East Indies, Malayan Archipelago, and tropical Australia. Flowers white or red, small, sub-umbellate. Leaves opposite, roundish, thick, fleshy. Stems rooting at the joints. For culture, *see* **Hoya.**

D. benghalensis (Bengalese). *fl.*, corollas small, urceolate; umbels few-flowered, from alternate axils, on short peduncles. September. *l.* oblong-lanceolate, two-edged, flat. India, 1818. (B. M. 2916.)

Dischidia—*continued.*

D. nummularia (Moneywort-leaved). *fl.* very small, in little sessile, axillary or interpetiolar clusters; calyx segments minute, corolla under one-and-a-half lines long; tube inflated; lobes narrow, longer than the tube; corona segments subulate. August. *l.* on very short petioles, nearly orbicular, thick, fleshy, not exceeding ⅛in. in diameter. *h.* 6in. Queensland. A succulent milky-juiced epiphyte, more or less mealy-white.

DISCOID. When, in *Compositæ*, the ray-florets are suppressed, the head of flowers is said to be Discoid.

DISCOLOR. Parts having one surface of one colour, and the other of another.

DISEASES. Many plants are subject to no Disease, although they may be particularly so to insect pests. Others, again, are susceptible to Disease at any stage of growth, and when it is often very difficult to know the cause from which the evil proceeds. Canker, Gumming, and Mildew are destructive Diseases to fruit-trees and plants. The cause of the first cannot be traced in many cases; while in others it may be discovered too late for applying a remedy, even if this were practicable. Gumming and Mildew are caused by Fungi. The progress of Disease in plants may often be stopped if measures are taken, when it is first detected, to find and, if possible, remove the cause. When once established, it is far more difficult to cure, or even check; fatal results being often the ultimate consequence. Diseases being caused by forces acting apparently under such opposite conditions in similar or different plants, it is impossible to give instructions for their prevention generally. A cold and undrained soil, or that which is excessively rich, sudden changes of temperature, improper pruning, draughts, or, on the other hand, a too close or moist atmosphere, with many other like conditions, tend to promote Disease, and should be always guarded against Diseases arising from the growth of a fungus on any parts of plants, are often greatly encouraged by a warm, moist atmosphere. Some of this description are amongst the most destructive, and, as a rule, it is very difficult or impossible to effect a cure, when they become established. The fungi which are more or less superficial in their growth—that is to say, live on the surface of the tissues—may be checked by dusting with sulphur, &c.; those, like the Potato Disease (*Peronospora*), for instance, which send their threads into the body of the host plant, cannot be destroyed by any such means.

DISEMMA. This genus is now merged into **Passiflora** (which *see*).

DISK. Any organ between the stamens and ovary, generally scaly or annular. The central tubular flowers of *Compositæ* are also called the Disk.

DISOCACTUS (from *dis*, two, *isos*, equal, and *Cactos*; in allusion to the number of the sepals and petals being constantly twice two). ORD. *Cacteæ*. This is now united with *Phyllocactus*, from the other members of which genus it only differs in its fewer sepals and petals.

DISPORUM (from *dis*, double, and *poros*, a pore; application not stated). Including *Prosartes*. ORD. *Liliaceæ*. A genus consisting of about a dozen species of perennials, natives of North America and the mountains of tropical Asia. Flowers solitary or clustered, at the tips of the branches. Leaves alternate, sessile or shortly stalked, ovate or lanceolate. Stems creeping, spreading, or erect from an underground rhizome, sparingly branched, leafy. The species thrive in a moist peaty border, and prefer partial shade. Propagated by seeds, or by dividing the plants in spring, before active growth commences.

D. fulvum (tawny). A synonym of *D. pullum.*

D. Hookerii (Hooker's). *fl.* greenish, one to six; segments spreading above, ½in. long, narrowed at base; stamens nearly equalling, or a little exceeding, the perianth. *l.* ovate, mostly deeply cordate, rough on the margins and nerves beneath. *h.* 1ft. to 2ft. California.

Disporum—*continued.*

D. lanuginosum (woolly).* *fl.* yellow, green; peduncles dichotomous, two-flowered. May. *l.* ovate-lanceolate, far acuminate, three-ribbed, reticulately veined, downy on the under, naked on the upper, surface. Stem terminating in two or three divergent branches, from green becoming brown, adpressedly downy. *h.* 1ft. South Carolina, 1758. Greenhouse. (B. M. 1490, under name of *Uvularia lanuginosa.*)

D. Menziesii (Menzies'). *fl.* greenish, one to five; segments nearly erect, ½in. to 1in. long; stamens a third shorter than the perianth. *l.* ovate to ovate-lanceolate, narrowly acuminate, rounded or slightly cordate at base, more or less woolly-pubescent. *h.* 1ft. to 3ft. California.

D. pullum (dusky).* *fl.*, corolla brown without, cernuous, longer than pedicels, cupped-campanulate; racemes one to four-flowered, axillary. September. *l.* ovate-lanceolate, acuminate, shortly petioled, nerved. Stem herbaceous, 1½ft. high, angular, subgeniculately flexuous. China, 1801. A singular greenhouse plant. SYN. *D. fulvum.* (B. M. 916, under name of *Uvularia chinensis.*)

D. p. parviflorum (small-flowered) only differs from the type in its smaller flowers.

DISSECTED. Cut into many deep lobes.

DISTEGANTHUS (from *distegos*, two stories, and *anthos*, a flower; referring to the disposition of the corolla above the receptacle). ORD. *Bromeliaceæ.* For culture, *see* **Bromelia.**

D. scarlatinus (scarlet) is described as being a magnificent stove perennial, with central leaves of a most intense vivid scarlet colour. Amazon, 1869. SYN. *Bromelia amazonica.*

DISTICHOUS. Producing flowers, leaves, or branches in two opposite rows.

DISTYLIUM (from *dis*, twice, and *stylos*, style; in allusion to the two styles). ORD. *Hamamelideæ.* A genus containing two or three species of greenhouse evergreen trees, natives of China, Japan, and Khasya. Flowers polygamous. Leaves alternate, persistent, thick, coriaceous, ovate, or oblong-lanceolate, entire; stipules lanceolate, caducous. The Japanese *D. racemosum*, and a variegated form, are the only ones in cultivation.

DITTANY. *See* **Cunila mariana** and **Dictamnus.**

DITTANY OF AMORGOS. *See* **Origanum Tournefortii.**

DITTANY OF CRETE. *See* **Origanum Dictamnus.**

DIURIS (from *dis*, double, and *oura*, a tail; in allusion to the two tail-like sepals). ORD. *Orchideæ.* This genus of terrestrial Orchids, containing about fifteen species, all of them interesting, and some very beautiful, is almost unknown in our gardens, and the species as yet introduced are very rare. All are natives of Australia. For culture, *see* **Pterostylis.**

D. alba (white). *fl.* white, rose, green, brownish-purple. August. *h.* 1ft. New South Wales, 1875. (B. M. 6201.)

D. curvifolia (curved-leaved). A synonym of *D. maculata.*

D. elongata (elongated). A synonym of *D. punctata.*

D. lilacina (lilac). A synonym of *D. punctata.*

D. maculata (spotted). *fl.* yellow, on long pedicels, much spotted or blotched with brown or purple, and sometimes almost entirely dark-coloured except the yellow centre of the petals, under ½in. long; dorsal sepal erect, rigid, and embracing the column at the base, ovate-oblong, and very open at the top; lateral sepals at length recurved, narrow, rarely exceeding the petals; petals ovate, on a long rigid dark-coloured claw; lip shorter than the dorsal sepal, three-lobed from above the base, the lateral lobes large and usually as long, or nearly as long, as the broad middle lobe. March. *l.* narrow. Queensland, 1825. A rather small slender species, usually under 1ft. high. SYNS. *D. curvifolia* and *D. pardina.* (B. M. 3156.)

D. pardina (leopard-marked). A synonym of *D. maculata.*

D. punctata (dotted). *fl.* blue or purplish, often dotted; dorsal sepal in the typical form broadly ovate-oblong; lateral sepals deflexed, very narrow; petals broadly elliptical-oblong; lip about as long as the dorsal sepal, divided at the base into three lobes. *l.* usually two, linear, 3in. to 6in. long, with two empty sheathing bracts above them. Stems 1ft. to 2ft. high, or even more. SYNS. *D. elongata* and *D. lilacina.*

DIVARICATE. Growing in a straggling manner.

DIVERGENT. Spreading outwards from a common centre.

DIVI-DIVI. The reddish-brown, tough, curved pods of *Cæsalpinia coriaria*; they are largely imported into this country for dyeing and tanning purposes.

DOCK. *See* **Rumex.**

DOCKWEED, TROPICAL. *See* **Pistia Stratiotes.**

DODDER. *See* **Cuscuta.**

DODECATHEON (from *dodeka*, twelve, and *theos*, gods; of fanciful application). American Cowslip. SYN. *Meadia.* ORD. *Primulaceæ.* A genus containing two or three species of very ornamental hardy herbaceous perennials, with oblong-spathulate leaves and naked umbellate scapes of flowers. Petals long, narrow, reflexed. They succeed in a moist position, and in a compost of leaf mould and loam. All the species are admirably adapted for sheltered parts of the rock garden, or for borders. They are of easy propagation by division of the crowns, either in spring or autumn, the latter preferred. In addition to their value outside, they may be employed for the decoration of cool greenhouses. For this purpose, the plants may be taken up in November, placed in 6in. pots, and kept in a cold frame until early in March. After flowering, they should be plunged in a bed of coal ashes for the summer, under a north wall. Dodecatheons will not bear forcing; neither should they be in a position exposed to hot sunshine in summer.

D. integrifolium (entire-leaved).* *fl.* deep rosy-crimson, not so large as those of *D. Meadia*; umbels small, few-flowered; petals white at the base. Early summer. *l.* ovate, entire. *h.* 4in. to 6in. North America, 1829. (B. M. 3622.)

D. Jeffreyi (Jeffrey's). A garden synonym of *D. Meadia lancifolium.*

FIG. 676. DODECATHEON MEADIA.

D. Meadia (Meadia).* *fl.* rosy-purple, white, or lilac, with yellow anthers; scape twice the height of the leaves, crowned by an elegantly drooping umbel. April. *l.* in large tufts, nearly erect, oblong-ovate, unevenly toothed, from 3in. to 7in. long, and about 3in. across at the broadest part. *h.* 10in. to 16in. North America, 1744. In the Western States, called Shooting Star. See Fig. 676. (B. M. 12.) There are several very excellent forms of this species including the following:

D. M. elegans (elegant). *fl.* deeper in colour, shorter and broader in leaf, and roundly toothed; flower-stems shorter; umbels more numerous, than in the type.

D. M. frigidum (cold).* *fl.* deep reddish-purple, not drooping; scape never more than six-flowered, mostly fewer. *l.* ovate, irregularly notched along the margins, about 3in. long, and spreading. Western North America, 1869. A very pretty dwarf form, with several nursery synonyms. It is somewhat difficult to grow, and should have stones placed around its roots to preserve an equable temperature. (B. M. 5871.)

Dodecatheon—*continued.*

D. M. giganteum (gigantic). A larger form in all its parts than the normal type, with pale green leaves; it also comes into flower about ten days earlier than *D. Meadia.*

D. M. lancifolium (lance-leaved).* *fl.* pink or rose, yellow towards the base; sepals and petals four each; scapes 1½ft. to 2ft. in height, supporting large umbels. Late spring. *l.* large, 6in. to 10in. long, or more, narrowly-spathulate, tapering towards the base. *h.* 1½ft. to 2ft. Rocky Mountains, 1867. A very distinct plant, easily recognisable by its very large leaves. SYN. *D. Jeffreyi* (of gardens). (F. d. S. 1662.)

Other forms are: *albiflorum* (white-flowered) (L. B. C. 1489) and *lilacinum* (lilac-flowered).

DOG ROSE. *See* **Rosa canina.**

DOG'S BANE. *See* **Apocynum.**

DOG'S MERCURY. *See* **Mercurialis perennis.**

DOG'S-TOOTH VIOLET. *See* **Erythronium.**

DOGWOOD. *See* **Cornus.**

DOLABRIFORM. Hatchet-shaped.

DOLICHOS (from *dolichos*, long; in reference to the length of the twining stems, which in some species extend to the tops of the loftiest trees). ORD. *Leguminosæ.* A large genus of stove, greenhouse, or hardy herbs or sub-shrubs. Flowers solitary or clustered in the axils, or in stalked racemes. Leaves pinnately trifoliolate; leaflets stipellate; stipules acute. Stems usually twining. Very few species are grown in gardens. They are of easy culture. All are increased by seeds; or cuttings of the perennials root readily under glass, in sand.

D. bicontortus (twice-twisted). *fl.* white and purple, disposed on long peduncles. Summer. *l.* trifoliate, on long petioles. Japan, 1869. Half-hardy climber.

D. lignosus (woody).* *fl.* rose-coloured, with a purplish keel; umbellate. July. *l.*, leaflets ovate, acute, smooth, glaucous beneath. Stem woody; branches twining, rather villous. India, 1776. Greenhouse evergreen. (B. M. 380.)

DOLIOCARPUS (from *dolios*, deceitful, and *karpos*, a fruit; fruits, though beautiful, are poisonous). ORD. *Dilleniaceæ.* A genus of mostly climbing shrubs, from tropical America. There are about a score species, very few of which have been introduced to cultivation, or are worth growing. For culture, *see* **Delima.**

D. Calinea (Calinea). *fl.* white; peduncles lateral, many-flowered. April. *fr.* a small fleshy shining berry. *l.* oblong, acuminated, quite entire. Guiana, 1822. Stove climber. (A. G. 221.)

DOLLINERA. *See* **Desmodium.**

DOMBEYA (named in honour of Joseph Dombey, a French botanist of the eighteenth century; he travelled in Peru and Chili as the companion of Ruiz and Pavon). ORD. *Sterculiaceæ.* Ornamental stove evergreen trees or shrubs. Flowers axillary or terminal, in few or densely-flowered cymes. There are nearly thirty species, all natives of Africa or the Mascarene Islands. They thrive in a compost of sandy loam and turfy peat. Cuttings of nearly firm young shoots will root in sand, if placed under a glass, and in bottom heat, in April.

D. acutangula (acute-angled). *fl.* red, large, in dichotomous crowded corymbs. *l.* smooth, cordate, acuminate, with three to five incised shallow, broad, or deep narrow, palmate lobes. *h.* 10ft. Mauritius, 1820. A low tree or shrub. SYN. *D. angulata.* (B. M. 2905 represents a variety in which the leaves are not at all lobed.)

D. angulata (angled). A synonym of *D. acutangula.*

D. Burgessiæ (Mrs. Burgess's).* *fl.* large, with spreading white petals, marked at their bases with a pleasing bright rosy tint, which also extends up the veins into the centre; disposed in large corymbose clusters. August to December. *l.* bright green, pubescent, from 6in. to 9in. long. *h.* 10ft. South Africa, 1865. (B. M. 5487.)

D. ferruginea (rusty-leaved). *fl.* white. *h.* 15ft. Mauritius, 1815.

D. Mastersii (Masters's).* *fl.* white, fragrant; peduncles axillary, bearing simple or sub-compound corymbs. *l.* cordate-ovate, velvety. Tropical Africa, 1867. (B. M. 5639.)

D. viburniflora (Guelder-rose-flowered). *fl.* white, about 1in. across, borne in terminal corymbose heads, 5in. in. diameter. February. *l.* large, cordate, three-lobed. *h.* 15ft. Comorin Islands, 1850. (B. M. 4568.)

DONDIA. A synonym of **Hacquetia** (which *see*).

DONDISIA. A synonym of **Plectronia** (which *see*).

DOODIA (named after Samuel Doody, a London apothecary and botanist). ORD. *Filices.* A small genus of greenhouse Ferns. Fronds pinnate or pinnatifid. Involucres membranous, the same shape as the sorus. Sori oblong or slightly curved, superficial, placed in one or more rows, parallel with, and between, the midribs and margins of the pinnæ. For culture, *see* **Ferns.**

D. aspera (rough).* *sti.* 2in. to 4in. long, erect, asperous. *fronds* 6in. to 18in. long, 2in. to 4in. broad, oblong-lanceolate, with numerous spreading linear pinnæ on each side, which are 1in. to 2in. long, ¼in. broad; margin strongly serrated, base dilated. *sori* oblong, in one or two rows. Temperate Australia, 1808. *D. a. corymbifera* is a very pretty form, having the apex of the fronds densely crested.

D. blechnoides (Blechnum-like). *sti.* 3in. to 4in. long, erect. *fronds* 1½ft. long, 6in. broad, oblong-lanceolate, with numerous spreading linear pinnæ on each side, which are about 3in. long and ¼in. broad, with sharply serrated margins and dilated bases. New South Wales, 1835. In the true type of this species, the upper pinnæ are connected, the lower ones shorter and free, not dwindling down to auricles, which, Mr. Baker notes, is the case with the plant grown under this name.

D. caudata (tailed). *sti.* 4in. to 6in. long, slender, smooth. *fronds* 6in. to 12in. long, 1½in. to 2in. broad, lanceolate, with numerous spreading linear pinnæ on each side, which are about 1in. long; frond often terminated by a long entire point. Australia, &c., 1820.

D. c. confluens (confluent). *fronds* long, narrow, linear, upper part undivided, sinuato-pinnatifid in the lower part, with short rounded lobes. New Caledonia. SYN. *D. linearis.*

D. dives (Dives). *sti.* 6in. to 12in. long, slender, erect, smooth, scaly towards the base. *sterile fronds* 1ft. long, 3in. to 5in. broad, oblong-lanceolate, with numerous spreading oblong-linear pinnæ on each side, which are 2in. to 3in. long, ¼in. broad; margin undulated and serrated. *fertile fronds* longer, with narrow linear pinnæ. *sori* linear-oblong. Ceylon.

D. linearis (linear). A synonym of *D. caudata confluens.*

D. lunulata (crescent-shaped). A synonym of *D. media.*

D. media (middle).* *sti.* 4in. to 6in. long, erect, smooth. *fronds* 1ft. to 1½ft. long, 1½in. to 4in. broad, lanceolate, with numerous spreading linear pinnæ on each side, which are 1in. to 2in. long, and about ¼in. broad; margin toothed, the upper ones dilated and connected at the base, those below the middle free and cordate, the lower ones gradually diminishing. *sori* short, oblong, distant. SYN. *D. lunulata.* There are several varieties, among which the following may be named:

D. m. duriuscula (rather hard). *fronds* firm, caudate; central pinnæ about ¼in. long, oblong, obtuse. *sori* one-serial, six to ten jugate. New Caledonia.

D. m. Kunthiana (Kunth's). *fronds* moderately firm; central pinnæ close, bluntish, sharply toothed. *sori* one-serial. Sandwich Islands.

DOODIA (of Roxburgh). A synonym of **Uraria.**

DOOM PALM. *See* **Hyphæne thebaica.**

DORCOCERAS. A synonym of **Bæa.**

DOREMA (from *dorema*, a gift; in reference to its production of gum ammoniac). ORD. *Umbelliferæ.* A genus containing two species of hardy herbaceous perennials, natives of Persia and Beloochistan. They are of easy culture in ordinary garden soil. Increased by seeds.

D. Ammoniacum (Ammoniac). Gum Ammoniac. *fl.* white; umbels proliferous, racemose; peduncles terete, woolly. June. *l.* large, petiolate, somewhat bipinnate, 2ft. long; lower leaflets distinct; superior ones confluent, deeply pinnatifid. *h.* 7ft. Persia, 1831. (B. M. Pl. 130.)

DORONICUM (from *Doronigi*, the Arabic name). Leopard's Bane. Including *Aronicum.* ORD. *Compositæ.* A genus of about a dozen species of mostly dwarf, early-flowering, hardy herbaceous perennials, natives of Europe and temperate Asia. Flower-heads yellow; involucral bracts in two or three series, nearly equal; disk-florets perfect, pappus hairs in many series; ray usually female only, destitute of pappus, or with from one to three hairs. Leaves alternate; radical ones petioled; cauline ones distant, often amplexicaul. They are of very easy culture in ordinary garden soil. Propagated by divisions.

D. altaicum (Altaic).* *fl.-heads* yellow. July. *l.* toothed, obovate, amplexicaul; radical ones obovate-spathulate, narrowed into the stalk. *h.* 1ft. Siberia, 1783.

D. austriacum (Austrian).* *fl.-heads* yellow, large; stems one to five-flowered. Spring. *l.* dentate; radical ones cordate, stalked; lower stem ones ovate-spathulate, abruptly narrowed at the base; upper ones lanceolate, cordate-amplexicaul. *h.* 1ft. to 1½ft. Europe. 1816. Plant somewhat hairy.

Doronicum—*continued.*

FIG. 677. FLOWERING BRANCHES OF DORONICUM CAUCASICUM.

D. caucasicum (Caucasian).* *fl.-heads* yellow, nearly 2in. across, solitary, terminal, axillary. Spring. *l.*, cauline ones ovate, pointed, with a broad clasping base, margins toothed; radical ones reniform, margins deeply toothed. *h.* 1ft. Europe, Asia. See Fig. 677. (B. M. 3143.)

D. Columnæ (Columna's). *fl.-heads* yellow, large. Spring. *l.* toothed, pubescent; radical ones stalked, almost kidney-shaped; lower cauline ones auricled; middle ones cordate-spathulate; upper ones ovate-lanceolate, amplexicaul. *h.* 1ft. to 1½ft. Europe, 1824.

D. Pardalianches.* Great Leopard's Bane. *fl.-heads* yellow, generally three to five on each stem. Spring. *l.* cordate, toothed; radical ones on long stalks, cordate; stem ones few, ovate; upper ones sessile, amplexicaul. *h.* 1½ft. to 3ft. Europe. This species is reputed to be poisonous. (Sy. En. B. 762.)

D. plantagineum (Plantain). *fl.-heads* yellow, usually solitary, and terminal. Spring. *l.* toothed; lower ones stalked, ovate, or slightly cordate; the rest sessile, except the lowest, which has a winged stalk, and half embraces the stem. *h.* 2ft. to 3ft. Western Europe (Britain). (Sy. En. B. 762.)

D. p. excelsum (tall).* *fl.-heads* yellow, as in the type, but larger, 3in. to 4in. in diameter; ray achenes glabrous, without pappus. March to October. *l.*, radical ones on long petioles, rather roughly hairy; stem ones amplexicaul, broadly cordate-ovate, acute, coarsely toothed. Stem stout, sparsely hispid, furrowed, simple, or with one or two branches. *h.* 5ft. or more. A very elegant plant, more robust than the type. (G. C. n. s., xx. 297.)

DORSAL. On the back; or growing on the back.

DORSTENIA (named after Theodore Dorsten, a German botanist, born 1492, died 1552). ORD. *Urticaceæ*. Very curious plants, of neat compact habit, and easily cultivated in a moderately damp stove. The flowers are on a flattened leaf-like receptacle, and are green and inconspicuous. Some of the species have elegantly cut leaves; whilst those of others are decorated with silver markings. Increased by divisions, made before active growth commences; or by seeds, sown on a hotbed, about March or April.

D. argentata (silvery).* *l.* elliptic, or oblong-lanceolate, 3in. to 5in. long, dark green at the margins, and having a broad silvery central band, which is irregularly extended towards the margin of the leaf. South Brazil, 1869. It is of erect habit, with a downy purplish stem. (B. M. 5795.)

D. Bowmanni (Bowmann's). *l.* lanceolate, 3in. to 5in. long, 1in. to 1½in. broad, acute, obscurely toothed, bright green and smooth above, variegated with a white border to the midrib and lower half of the principal veins. Receptacle round, irregularly lobed, purple beneath. Stems about 6in. high, leafy. Rio Janeiro, 1872. (Ref. B. 303.)

Dorstenia—*continued.*

D. maculata (spotted). *l.* deep green, blotched with white, subradical, springing from a creeping rhizome, long-stalked, cordate at the base, hastate; margin crenate-dentate; receptacle quadrate, green. Mexico, 1863. (I. H. 362.)

D. Mannii (Mann's).* *fl.*, receptacle on the stem at the scars of old leaves; peduncles orbicular, about 1in. in diameter, green, pubescent on the back, very convex; margin with ten to fifteen slender, stiff, unequal processes; peduncle ½in. long; surface of receptacle nearly smooth. November. *l.* rather membranous, elliptic or obovate, acute, narrowed at the small obtuse or subcordate base, dark green, pale beneath, obscurely sinuate-toothed, or quite entire, glabrous, but opaque on both sides. Stem 6in. to 10in. high, terete, rather flexuous, erect, somewhat swollen at the scars of the fallen leaves, densely tomentose. *h.* 1ft. West tropical Africa, 1863. A very singular plant. (B. M. 5908.)

D. tubicina (Peziza-flowered). *fl.* numerous; scapes about equal in length with the petioles, terminated by a Peziza, or wine-glass-shaped receptacle, whose margin is incurved and crenated with granulated scales; anthers purplish, two-lobed. August. *l.* slightly pubescent, cordate-oblong, denticulate at the margin, reticulato-venose, petiolated; petiole about as long as the leaf. Root large in proportion to the size of the plant, woody, sub-fusiform, descending, truncated or præmorse, powerfully aromatic. *h.* 3in. Trinidad, 1817. A very rare and curious plant. (B. M. 2804.)

DORYANTHES (from *dory*, a spear, and *anthos*, a flower; the flower-stem is from 12ft. to 20ft. high, like

FIG. 678. DORYANTHES EXCELSA.

Doryanthes—*continued.*

the handle of a spear, bearing flowers on the top). ORD. *Amaryllideæ*. A genus of extremely beautiful amaryllids, requiring greenhouse culture, similar to *Dasylirion*, *Fourcroya*, &c. They thrive best in a compost of loam and leaf soil, in equal parts. Propagated from suckers, which should be placed in small pots, and grown on, repotting into larger sizes as becomes necessary. A considerable size of plant has to be attained before flowers are produced.

D. excelsa (tall).* *fl.* very brilliant scarlet, each as large as the common white Lily, disposed in a globose head at the top of the bracteate stem, the base of which is surrounded by leaves. Summer. *l.* numerous, long, lanceolate. *h.* 8ft. to 16ft. New South Wales, 1800. See Fig. 678. (B. M. 1685.)

D. Palmeri (Palmer's).* *fl.* red, with the centre lighter, large, funnel-shaped; spike pyramidal, 1ft. to 1½ft. high, and 10in. to 12in. broad, many-flowered, clothed with leafy bracts. *l.* in a dense tuft, broad-lanceolate, each about 6ft. long by 6in. in breadth, gracefully arching. *h.* 8ft. to 16ft. Queensland, 1874. This is a very handsome species. (B. M. 6665.)

DORYCNIUM (the old Greek name of a species of *Convolvulus*, from *dory*, a spear). Including *Bonjeania*. ORD. *Leguminosæ*. A genus of about half-a-dozen species of elegant hardy herbs or sub-shrubs. Flowers capitate or sub-umbellate, usually numerous. Leaves trifoliolate, with the stipules in the form of the leaflets. All are of the easiest culture in rather dry soil, and are readily increased by seeds.

D. herbaceum (herbaceous). *fl.* white; heads on long peduncles. July. *l.*, leaflets and stipules obovate, obtuse. Stem herbaceous, erect. *h.* 1½ft. South Europe, 1802.

D. hirsutum (hairy). *fl.* whitish, or pale red, large; heads many-flowered. July. *l.* sessile; leaflets ovate, lanceolate or obovate. Stem erect, suffruticose. *h.* 1ft. to 2ft. South Europe, 1683. Plant clothed with hoary tomentum. (B. M. 336, under name of *Lotus rectus*.)

D. latifolium (broad-leaved). *fl.* white; peduncles many flowered, bracteate towards the apex. June. *l.* sessile; leaflets and stipules obovate and mucronulate. Stem erect, sub-shrubby. *h.* 1ft. to 2ft. East Europe, 1818. Plant pilose.

D. rectum (upright). *fl.* rose-coloured, small; peduncles bractless, many-flowered. June. *l.* petiolate; leaflets obovate, mucronate. Stem erect, shrubby. *h.* 2ft. South Europe, 1640. Plant villous.

D. suffruticosum (sub-shrubby).* *fl.* white, with a reddish keel; heads of flowers on long peduncles. June. *l.*, leaflets and stipules oblong-lanceolate, acute. Stem shrubby. *h.* 2ft. to 3ft. South Europe, 1640. (S. F. G. 760, under name of *Lotus Dorycnium*.)

DORYOPTERIS. Included under *Pteris*.

DOSSINIA (named in honour of E. P. Dossin, a Belgian botanist). ORD. *Orchideæ*. The only species in this genus is a small terrestrial Orchid, nearly allied to *Anœctochilus*, but differing in the boat-shaped process of the column, as well as in the absence of a bearded fringe to the lower part of the lip.

D. marmorata (marbled)* is the correct name of the plant described in this work under the name of *Anœctochilus Lowii*. SYN. *Cheirostylis marmorata*. (F. d. S. 370.)

DOUBLE FLOWERS. Generally speaking, the epithet Double is applied to flowers of very varied structural conformation. The most common conditions rendering a flower Double, in the popular acceptation of the term, are substitutions of petals or petal-like bodies for stamens and pistils, one or both. Another very common mode of Doubling is brought about by a real or apparent augmentation in the number of petals, as by multiplication, fission, &c. Double Flowers are often of much more value, from a purely horticultural standpoint, than single ones. The protective floral organs—the calyx and corolla—frequently wither quickly after fertilisation has taken place, whilst in those flowers in which the organs of reproduction have been metamorphosed into petaloid bodies, they remain, as a rule, in full beauty a much longer time. The predisposing causes of Doubling seem very different in various plants. In some, it may be brought about by an excess of nutrition; in others, by a process akin to starvation. In some cases, as in the common *Kerria japonica*, for example, there is a natural

Double Flowers—*continued.*

tendency for the flowers to become Double under cultivation. Single-flowered plants have been imported which, in a few years, have altogether ceased to produce single flowers. For a very exhaustive account of the various kinds of Doubling, and their morphological significance, the reader is referred to one of the Ray Society's publications, "Vegetable Teratology," by Dr. M. T. Masters. The means adopted by some successful growers to obtain Double Stocks will be described under **Stocks.**

DOUBLY-SERRATED. Twice serrated.

DOUGLASIA (named in honour of D. Douglas, a very zealous botanist and collector in North-west America; he came to an untimely end in the Sandwich Islands). ORD. *Primulaceæ*. A genus of four species of little hardy evergreen plants, allied to *Androsace*. They form admirable subjects for alpine situations. A compost of peat and loam is the best soil for them. Propagated by seeds. In Europe, the genus is represented by *D. Vitaliana*, already mentioned in this work under its more generally accepted name, *Androsace Vitaliana*. The other three species belong to Arctic North America.

D. nivalis (snowy).* *fl.* pink, sub-umbellate, on long peduncles. April. *l.* linear, obtuse, sub-amplexicaul, closely hairy. Branches rigid, hoary, sub-verticillate. *h.* 3in. Rocky Mountains, 1827 (B. R. 1886.)

DOUM PALM. *See* **Hyphæne thebaica.**

DOVE FLOWER. *See* **Peristeria elata.**

DOWN. A term applied to soft, short hairs, like down.

DOWNINGIA (named in honour of A. J. Downing, a promoter of horticulture). SYN. *Clintonia*, under which generic name the two species below-mentioned are generally included, but erroneously so. ORD. *Campanulaceæ*. Very ornamental annuals. Flowers bilabiate. Leaves small, linear-lanceolate. They are used with great effect in summer flower-gardening, and but little care is necessary to insure success. Seeds should be sown in a spent hotbed, in March, thinned out, so as to give the plants room, and kept growing till May, when they may be transferred to the open border. *D. pulchella* is especially pretty for hanging baskets.

D. elegans (elegant).* *fl.* blue, having a large white streak on the base, solitary, axillary, sessile. Summer. *l.* sessile, ovate, three-veined. *h.* 6in. North-west America, 1827. (B. R. 1241.)

D. pulchella (fair).* *fl.* rich blue, with yellowish eyes; upper segments of corolla ovate, acute, divaricate; middle segment of lower lip longest. Summer. *l.* obtuse. *h.* 6in. California, &c., 1827. SYN. *Clintonia pulchella*. (B. R. 1909.)

DRABA (Greek name used by Dioscorides, from *drabe*, acrid; referring to the taste of the leaves). Whitlow Grass. Including *Petrocallis*. ORD. *Cruciferæ*. More than 150 species have been described; but it is probable that not more than half that number are really distinct. Perennial or annual branched herbs, which are sometimes tufted, sometimes elongated, smooth or pilose, or usually velvety from soft branched hairs. Flowers white or golden, rarely pink or purple; racemes terminal; pedicels filiform, bractless. Leaves linear, oblong or ovate, entire or toothed.

"Amongst the spring-flowering alpines," says Mr. Robinson, "the genus *Draba* must always take an important position. In addition to the brilliant golden colour of the flowers of one section of the genus, the plants are characterised by a dwarf compact habit, and by much neatness in the arrangement of the bristly ciliated hairs, which not unfrequently become bifurcate; thus the attractive appearance in the matter of colour is enhanced, on a closer inspection, by the beauty of form and detail. In another section, we find white to be the predominant colour; and though in many cases the flowers are small, still, in the mass, filling up a nook or crevice in a rockwork, and contrasted with the dark green leaves,

Draba—*continued.*

they become very effective. They should be placed in the sunniest aspect on a rockery; the more effectually the plants are matured by the autumn sun, the more freely will they return these favours by an abundant bloom in early spring."

The perennials may be propagated by dividing at the roots; the annuals or biennials by seeds, which should be sown in ordinary garden soil, in the open border, in spring. Many of the strictly annual species may be made biennial by sowing seeds too late to allow the plants to flower the first season. Perennials, except where otherwise stated.

D. aizoides (Aizoon-like).* *fl.* yellow; scapes naked, smooth; stamens about the length of the petals. March. *l.* lanceolate-linear, keeled, ciliated. *h.* 2in. to 3in. Europe (South Wales). (Sy. En. B. 138.)

D. Aizoon (Aizoon).* *fl.* bright yellow; scapes naked, villous. April. *l.* linear, acutish, keeled, stiff, ciliated. *h.* 3in. Mountains of Western Europe, 1819. SYN. *D. ciliaris.*

D. alpina (alpine).* *fl.* golden-yellow, a little smaller than those of *D. aizoides*; scapes naked, pubescent. April. *l.* lanceolate, flat, pilose, with branched hairs. *h.* 3in. Northern Europe, 1816.

D. aurea (golden). *fl.* yellow; petals obovate, blunt, clawed. May. *l.* oblong-linear, acute, entire, pubescent. Stem leafy, somewhat branched, velvety. *h.* 6in. Greenland, 1824. Biennial. (B. M. 2934.)

D. bruniifolia (Brunia-leaved). *fl.* yellow; petals twice the length of the calyx and stamens; scapes naked, pubescent. June. *l.* linear, somewhat keeled, ciliated, acute, loosely rosulate. *h.* 4in. Caucasus, 1825. Plant loosely tufted. (R. G. 780.)

D. ciliaris (hair-fringed). A synonym of *D. Aizoon.*

D. cinerea (grey). *fl.* white. Early spring. *l.* oblong-linear, entire; stem leaves five or six, entire, scattered. Stem leafy, somewhat pubescent. *h.* 3in. to 6in. Siberia, 1820. Biennial.

D. cuspidata (cuspidate). *fl.* yellow; scapes naked, villous. Spring. *l.* linear, acutish, keeled, ciliated. *h.* 3in. Tauria, 1821. Closely allied to *D. Aizoon.*

D. glacialis (icy).* *fl.* bright golden-yellow; scapes naked, covered with starry pubescence. May. *l.* linear-lanceolate, entire, hispid with stellate hairs. *h.* 2in. Siberia, 1826. Closely allied to *D. aizoides*, but differing from it in having a few-flowered stem, and pedicels which are shorter than the pod.

D. lapponica (Lapland). *fl.* white; scapes naked, very smooth. May. *l.* lanceolate, quite entire, rather pilose. *h.* 2in. or 3in. Alps of Lapland, 1824.

FIG. 679. DRABA MAWII.

D. Mawii (Maw's).* *fl.* ¾in. in diameter; sepals very concave, bristly at the back, green, tipped with red-brown; petals three times as large as the sepals, obovate-cuneate, retuse, spreading, quite white. Spring. *l.* linear-oblong, obtuse, shining; margin pectinate, with rigid incurved or spreading bristles; under surface with a prominent midrib. Spain, 1873. An excellent rock plant, forming low densely-tufted bright-green patches. See Fig. 679. (B. M. 6186.)

D. nivalis (snowy).* *fl.* white; scapes naked or one-leaved, smooth. April. *l.* oblong-linear, ciliated, and somewhat pilose. *h.* 1in. or 2in. Arctic Europe, 1820. Habit more compact than *D. lapponica.*

D. pyrenaica (Pyrenean). Rock Beauty. *fl.* at first white, afterwards changing to purple; scapes naked. May. *l.* cuneiform, palmate, three-lobed. *h.* 2in. to 3in. Mountains of South Europe. SYN. *Petrocallis pyrenaica.* (B. M. 713.)

Draba—*continued.*

D. Sauteri (Sauter's). *fl.* yellow; scapes smooth. Spring *l.* spathulate, stiff, ciliated. *h.* 4in. Switzerland.

D. tridentata (three-toothed). *fl.* yellow; scapes naked, smooth. August. *l.* obovate, narrowed at the base into the petiole, three-toothed at the apex, hairy. *h.* 3in. Caucasus, 1838.

D. violacea (violet).* *fl.* deep violet-purple. *l.* opposite, ovate, downy. Stem suffruticose, branched, diffuse. *h.* 6in. to 12in. Quito Andes, 1867.

DRACÆNA (from *drakaina*, a female dragon; the inspissated juice becomes a powder, like dragon's blood). SYNS. *Pleomele, Terminalis.* ORD. *Liliaceæ.* A genus of about thirty-five species of ornamental stove foliage plants, widely dispersed over the tropics. Flowers generally fascicled in panicles, in a few species in dense sessile heads or oblong spikes. The differences between *Cordyline* and *Dracæna* (the two genera having been much confused in gardens) reside principally in the fruits, &c. The flowers of *Dracæna* are generally larger than those of *Cordyline*, and the cells of the ovary in the latter genus contain many ovules, whilst in *Dracæna* they generally contain but one.

Propagation. Dracænas, and the large group of plants grown as such, but which properly belong to the genus *Cordyline*, are easily and rapidly increased by cutting up the stems of old plants, in pieces 1in. or 2in. long, and placing them, at any season, in cocoa-nut fibre, or light soil, in the bottom heat of a propagating house. The tops of the plants will strike as cuttings, and the fleshy base of the stem may also be occasionally removed, and utilised for propagation. Young plants are soon obtained from the latter, and from almost every

FIG. 680. DRACÆNA CONCINNA.

Dracæna—*continued.*

eye of the firm wood that has been cut in pieces and inserted.

Cultivation. Although the class of plants under notice belong essentially to the stove, they will keep in good condition in a greenhouse in summer. Many are also well adapted for room or table decoration, particularly those with recurved narrow leaves. Useful sizes for such purposes may soon be obtained, if stove treatment, with plenty of light, be given. A compost of loam and lumpy peat, in equal proportions, with the addition of a little charcoal, will suit them admirably. Dracænas or Cordylines require but a moderate amount of pot room, in comparison to the size of plant that may be obtained. Pots 5in. or 6in. in diameter are large enough for useful decorative subjects 1ft. or 1½ft. high; and such plants may be potted on into proportionately larger sizes if required for exhibition or for large specimens. Plenty of heat and moisture are requisite when the plants are young, to encourage a vigorous, quick growth. It is not advisable, however, to syringe too much in winter, as the water, lodging in the axils of the leaves, is, at that season, liable to prove injurious. Exposure of the plants to plenty of light is requisite for obtaining the highest development of colour in their leaves. *See also* **Cordyline.**

Dracæna—*continued.*

D. arborea (tree-like). *fl.* greenish, ⅜in. long. May. *l.* dense, sessile, lorate, 1½ft. to 3ft. long, 2in. to 3in. wide in middle. *h.* 40ft. Northern Guinea, 1800.

D. cernua (drooping). A synonym of *D. reflexa.*

D. concinna (neat).* *l.* narrow, of a sombre green, with purplish-red margins; the contracted stalk-like base is also green, with a slight purplish tinge. *h.* 6ft. Mauritius, 1870. A very useful neat-growing species, with a dwarf, compact habit. See Fig. 680. (R. G. 1864, 441.)

D. cylindrica (cylindrical). *fl.* white, small; spike cylindrical, sessile, terminating the stem. *l.* linear-lanceolate, or obovate-lanceolate, bright green, spreading. Stem erect, undivided. *h.* 5ft. West tropical Africa. (B. M. 5846.)

D. Draco (Dragon).* Dragon-tree. *fl.* greenish-white, very small, forming into a large panicle. *l.* lanceolate-linear, entire, glaucous disposed in a crowded head. Stem arboreous, simple, or divided at the top, and, when old, becoming much branched, each branch being terminated by a head of leaves. *h.* 40ft. Canary Islands, 1640. This very fine species is much more graceful and elegant when in a young state than when it becomes old. It can be used very effectively in sub-tropical gardening, and may remain in the open from May to September, inclusive. There are few better ornaments for a conservatory than well-grown specimens of this plant. The famous Dragon-tree of Orotava measured 60ft. in height, and the stem was 15ft. in diameter. (B. M. 4571.)

FIG. 681. DRACÆNA GOLDIEANA.

D. elliptica (elliptic). *fl.* greenish-yellow, rarely solitary, mostly in pedicellate fascicles of threes. March. *l.* generally spreading, petiolate, coriaceo-membranaceous, elliptical-lanceolate, glossy, acute and mucronate, closely marked with parallel longitudinal lines or striæ, full green; petiole grooved, dilated, and amplexi

Dracæna—*continued.*

caul at the base. Stem fruticose, 2ft. to 3ft. or more high, terete. *h.* 2½ft. India, Java, &c. SYN. *Sansevicra javanica.* There is a pretty variety, *maculata* (B. M. 4787), having its leaves spotted or blotched with yellow.

D. fragrans (fragrant). *fl.* very fragrant. April. *l.* lanceolate, lax. *h.* 6ft. Tropical Africa, 1768. (B. M. 1081.)

D. f. Lindeni (Linden's).* *l.* deep green, traversed their entire lengths by bands of creamy-white and various shades of yellow; elegantly recurved, lanceolate-acuminate. 1879. This plant forms a highly useful subject for decorative purposes. (I. H. xxvii. 384.)

D. Goldieana (Goldie's).* *fl.* in a dense globose sessile head, 2in. in diameter, surrounded on the outside by a few reduced leaves; perianth white, above 1in. long, with lanceolate spreading segments. *l.* cordate-ovate, acuminate, with a yellowish-green costa, marbled and irregularly banded with dark green and silvery-grey in alternate straight or furcate bands. West tropical Africa, 1872. A very magnificent ornamental foliage plant, of erect habit, and with closely-set, stalked, spreading leaves. See Fig. 681, for which we are indebted to Mr. Wm. Bull. (B. M. 6630.)

D. marginata (bordered). *l.* ensiform, densely rosulate, 1ft. to 1½ft. long by ⅜in. broad, spreading, rigid, green, margined and veined with red. Trunk 4ft. to 5ft. high, 1in. thick, branched. Madagascar.

D. phrynioides (Phrynium-like).* *l.* broadly ovate, acuminate, coriaceous, 6in. to 8in. long, exclusive of the petiole; upper surface very dark green, profusely spotted with pale yellow; under surface paler. Fernando Po, 1863. A very pretty dwarf growing plant, requiring plenty of heat and moisture to cultivate it to perfection. (B. M. 5352.)

D. reflexa (reflexed). *fl.* greenish-yellow, nearly 1in. long, very numerous, disposed in a handsome branching raceme. *l.* oblanceolate. *h.* 12ft. to 15ft. Mauritius, 1819. SYN. *D. cernua.*

D. Saposchnikowi (Saposchnikow's). *fl.* whitish. Spring. *h.* 10ft. 1870. A tree-like species, of branching habit, and distinct character. Native country unknown. 1870. (R. G. 705.)

D. Smithii (Smith's). *fl.* in crowded fascicles in the axils of the panicle, and terminating short branchlets, sub-sessile; perianth pale yellow, ¼in. long. Winter or early spring. *l.* 3ft. to 4ft. long, forming a spreading rosette on the crown of the stem, slightly recurved, not waved, narrowly ensiform, broadest beyond the middle, acuminate, bright green, striated; midrib indistinct above, very strong and prominent beneath. Stem slender, 15ft. high, hitherto quite unbranched, cylindric, almost smooth. Tropical Africa, 1850. This species is closely allied to *D. fragrans.* (B. M. 6169.)

D. surculosa maculata (spotted sucker).* *fl.* pale yellowish, small, disposed in a lax globose corymb. *l.* green, with yellow spots, lanceolate. Old Calabar, 1867. A pretty slender shrub. (B. M. 5662.)

D. umbraculifera (umbrella-bearing). *l.* 2ft. to 3ft. long, about 1in. wide, dark green, very closely set, horizontal, with the ends slightly recurved, giving it the appearance of a table top or umbrella. *h.* 10ft. Mauritius, 1778. A very peculiar and distinct species. (L. B. C. 289.)

Many other plants, usually known as Dracænas, will be found described under the genus **Cordyline.**

DRACOCEPHALUM (from *drakon*, a dragon, and *kephale*, a head; in reference to the ringent corollas). Dragon's Head. ORD. *Labiatæ.* A genus of about thirty species of perennial or annual herbs, natives of Europe and extra-tropical Asia. Whorls many-flowered, axillary or approximate into a terminal spike; bracts usually foliaceous; corolla generally large, with a very wide throat and a bilabiate limb. Leaves entire, dentate or palmatifid. Very showy border plants, when in flower. All are hardy, and delight in a cool situation. The perennial species are readily increased by divisions of the root, or by cuttings of the young shoots, in April or May; the annuals, by seeds, sown in the open, in April. Perennials, except where otherwise stated.

D. altaiense (Altaian).* *fl.* blue, nearly 2in. long; whorls disposed in oblong spikes, which are 2in. to 3in. long; floral leaves orbicular, pilose. July. *l.*, radical ones on long petioles, oblong, obtuse, crenated, cordate at the base; cauline ones shortly petiolate, ovate. Stems erect. *h.* 6in. to 9in. Siberia, 1759. See Fig. 682. SYN. *D. grandiflorum.* (R. G. 855.)

D. argunense (Argun). *fl.* blue, pubescent; whorls sub-spicate. July. *l.* linear-lanceolate, quite entire, glabrous, nearly sessile. Stems erect. *h.* 1ft. to 1½ft. Dahuria, 1822. (L. B. C. 797.)

D. austriacum (Austrian).* *fl.* blue, over 1½in. long; whorls somewhat interruptedly spicate, six to ten-flowered; floral leaves hispid. July. *l.* three to five-cleft; segments linear, with revolute edges. Stems erect, rather pilose. *h.* 1½ft. Europe, 1597.

D. canescens (hoary). A synonym of *Lallemantia canescens.*

Dracocephalum—*continued.*

D. grandiflorum (large-flowered). A synonym of *D. altaiense.*

D. Moldavica (Moldavian). *fl.* blue or white, with a very wide throat; whorls distinct, disposed in long racemes; floral leaves narrower. July. *l.* petiolate, lanceolate, deeply crenated. Stem erect, branched. *h.* 1ft. to 1½ft. Eastern Siberia, 1596 Annual.

D. nutans (nodding). *fl.* blue; whorls distinct, many-flowered, disposed in long nutant racemes; floral leaves oblong-lanceolate. July. *l.* petiolate, ovate, crenated. Stems erect. *h.* 1ft. Eastern Russia, 1731. (B. R. 841.)

D. peregrinum (diffuse).* *fl.* blue; inflorescence about 1½ft. long; whorls distinct, few-flowered, secund; floral leaves quite entire. July. *l.* quite glabrous, on short petioles, lanceolate, mostly few-toothed. Branches ascending. Siberia, 1759. Plant decumbent. (B. M. 1084.)

D. Ruprechtii (Ruprecht's). *fl.* rosy-purple or lilac, about 1in. long, disposed in axillary clusters. *l.* ovate-lanceolate, variously incised and toothed. *h.* 1½ft. Turkestan, 1880. Of a very dwarf, neat habit. (R. G. 1018.)

FIG. 682. DRACOCEPHALUM ALTAIENSE, showing Habit and Single Flower.

D. Ruyschianum (Ruysch's). *fl.* purplish, 1in. long; whorls approximate, sub-spicate, generally six-flowered. June. *l.* linear-lanceolate, quite entire, 1in. to 1½in. long, nearly sessile, with revolute edges, having young ones in the axils. Stems erect, finely pubescent. *h.* 2ft. Europe, 1699.

D. R. japonicum (Japanese).* *fl.* white; central lobe of corolla with a blue border and white spots. *h.* 2ft. Japan, 1879. A very fine plant, and an improvement on the typical species.

D. speciosum (showy).* *fl.* pinkish-blue; lip with darker spots; whorls two to four, dense, sub-secund. June. *l.*, radical ones on long petioles, broadly heart-shaped; cauline ones few, shortly petiolate; all wrinkled and green on both surfaces, and pubescent beneath. *h.* 1½ft. Himalaya, 1877. (B. M. 6281.)

DRACONTIUM (Greek name applied by Hippocrates to another plant, a diminutive of *drakon*, a dragon; in reference to its spots and streaks being like those on serpents). Dragon. ORD. *Aroideæ* (*Araceæ*). Stove plants, more remarkable than beautiful or ornamental. Flowers fœtid, hermaphrodite, in a sessile spadix with a hooded spathe. Leaves stalked, pedate. Rhizome thick, fleshy. There are about six species, all natives of tropical America. For cultivation, *see* **Amorphophallus.**

D. albostipes (white-stalked). *l.* solitary, tripartite; divisions winged, and bearing irregularly dichotomous leaflets of a bright green colour; stalk or petiole tall, stout, scabrous at the base, tapering upwards, of a greyish-white, with distinct blotches of a darkish brown running round them in irregular bands. *h.* 3ft. Antioquia, 1877.

D. annulatum (ringed). *l.* of a bright green, tripartite, each division laterally branched on one side; petiole stoutish, erect, dull umber-brown, mottled in irregular rings with pale brown and whitish-brown markings. *h.* 3ft. Antioquia, 1877.

D. asperum (rough).* *fl.*, spathe purplish-brown, erect, boat-shaped; spadix erect, cylindrical, about 2in. long. *l.* pedately divided into three (or five) main subdivisions, usually solitary, but sometimes two, spreading horizontally, 3ft. to 4ft. across; ultimate segments oblong-lanceolate, acuminate, entire; petiole 5ft. to 6ft. high, as thick as a man's thumb at the base gradually

Dracontium—*continued.*

tapering upwards, with wavy bands or blotches of a purplish colour, mottled with white. 1869. SYNS. *D. elatum* (G. C. 1870, 344) and *Amorphophallus nivosus.* (Ref. B. 282.)

D. Carderi (Carder's).* *l.* tripartite; divisions often twice dichotomous, with oblong segments and an irregularly-winged rachis; petiole tall, erect, slightly asperous near the base, of a dull flesh-colour, and freely banded with irregular blotchy rings of an umber-brown hue, the flesh-colour predominating. *h.* 3ft. Antioquia, 1877. (B. M. 6523.)

D. elatum (tall). A synonym of *D. asperum.*

D. gigas (giant). *fl.*, spathe bluish-brown outside, brownish-red within, about 2ft. long, supported on a scape 3ft. long. *l.* solitary, broad, trichotomously divided, supra-decompound, nearly 4ft. long; ultimate divisions confluently pinnatifid; petiole yellow, beautifully barred and striped with purple. *h.* 10ft. Nicaragua, 1869. SYN. *Godwinia gigas.* (B. M. 6048.)

D. polyphyllum (many-leaved). *fl.*, inflorescence appearing after the entire decay of the foliage; spathe upon first opening emitting an abominable fœtor. The plant figured in B. R. 700 flowered in December. *l.* supra-decompound, pedate. *h.* 2ft. India, 1759. A very singular species. (B. R. 700.)

DRACOPHYLLUM (from *drakon*, a dragon, and *phyllon*, a leaf; in reference to the leaves resembling those of *Dracæna Draco*). Including *Sphenotoma.* ORD. *Epacrideæ.* A genus of about twenty-five species of greenhouse shrubs or small trees, of which eleven are from New Zealand, five from New Caledonia, and the rest from extra-tropical Australia. Spikes or racemes terminal, simple, or compound. Leaves imbricate, cucullate at the base, and half-sheathing. For culture, *see* **Andersonia.**

D. capitatum (round-headed).* *fl.* pure white, in terminal heads, very delicate; bracts two, at the base of the calyx; corolla salver-shaped; limb of five spreading, very obtuse segments; mouth contracted. Summer. *l.* ensiform-lanceolate, pungent, dark green, tipped with red and somewhat spreading on the stem; paler-coloured, smaller, and close-pressed upon the branches. *h.* 1ft. to 1½ft. West Australia. A very pretty plant. (B. M. 3624.)

D. gracile (slender).* *fl.* snow-white, collected in terminal, ovate, compact heads, sweet-scented, especially in the evening; calyx two-bracted, sessile, green, five-leaved; corolla saucer-shaped; limb five-cleft; peduncles clothed with closely-adpressed, erect, sheathing leaves or bracts. June. *l.* lanceolate, recurved, sheathing the stem at their base, mucronulate and sub-pungent, collected at the extremities of the sterile branches into green globular heads. Branches straggling. West Australia, 1826. A handsome, but low, straggling shrub. (B. M. 2678.)

D. secundum (side-flowering). *fl.* white; corolla tubularly funnel-shaped. April. *h.* 1ft. to 2ft. New South Wales, 1823. (B. M. 3264.)

DRACOPIS. This genus is now included under **Rudbeckia** (which *see*).

DRACUNCULUS (diminutive of *draco*, from *drakon*, a dragon; the petioles, &c., being marked like the skin of a snake). ORD. *Aroideæ* (*Araceæ*). A genus of two or three species, nearly allied to *Arum*, from which it principally differs in the upper portion of the spathe being flat and not convolute. Leaves pedately divided. Stems spotted. Rhizomes tuberous. The species most commonly met with in gardens is *D. vulgaris* (often called Dragon), already described in this work as **Arum Dracunculus** (which *see*). The other two, which are much less frequently seen, are *D. canariensis* and *D. creticus.*

DRAGON. *See* **Dracontium** and **Dracunculus.**

DRAGON'S BLOOD. The Dragon's Blood of commerce is a resin used in medicine as a colouring agent, and in plasters and tooth-powders. It is furnished by *Calamus Draco*, and is imported into this country from Eastern Sumatra, Southern Borneo, &c. The resin covers the scales of the fruit with a thin coat, and is obtained by shaking the fruits or beating them in a sack, then melting in the sun or in boiling water, and afterwards moulding into lumps, balls, or sticks. The name Dragon's Blood is also given to resins yielded by *Dracæna Draco* in the Canary Islands, by *Dracæna cinnabarina* in Socotra, and also by *Pterocarpus Draco.*

DRAGON'S HEAD. *See* **Dracocephalum.**

DRAGON-TREE *See* **Dracæna Draco.**

DRAINING. Efficient Drainage is one of the most important points in connection with the cultivation of garden crops. No plant will succeed in an undrained soil, which soon becomes sour and water-logged, either in a pot or elsewhere. Placing crocks or other porous material in pots, in such a manner as to allow of the free passage of superfluous water from the plants, for a considerable time, if necessary, cannot be too carefully practised. In Draining the whole or any part of a garden, a few important conditions will have to be considered. First, it should be known whether there is an accumulation of land water near enough the surface to cause injury, or if it is the surface water only that will need to be conducted away. This will depend a great deal on the tenacity of the soil. Land, somewhat light on the surface, with a gravelly sub-soil, will generally be sufficiently porous underneath to allow all such water to pass away naturally without Drains, excepting those required for the walks. Heavy soils, with a sub-soil of clay, require an efficient system of Drainage to render them fit for the cultivation of fruit-trees or any garden crops. Water collecting underneath the surface is the greatest evil. If this be removed, the surface water will naturally follow, and must, of necessity, be succeeded each time by fresh air. A main Drain, large enough to receive and conduct the water from all the branches along its course, should be first inserted. A means of outlet lower than any part of the land to be Drained, is necessary, and the main should proceed in a tolerably straight line from the highest point to this, with an equal gradient throughout. The branches may be arranged at right angles, at distances of 15ft. to 20ft. apart, according to the quantity of water that accumulates, or the nature of the soil. Pipes 3in., or even 2in., in diameter, will generally be large enough; their position should be fixed beforehand, and sockets inserted in the main for their reception. Tools specially employed for Draining are the best, being made long and narrow, to admit of digging trenches deep without being wide. A main Drain-pipe, 6in. in diameter, will conduct away a large quantity of water, and this, with its outlet, should be sufficiently deep to allow a fall for all the branches connected. The requisite depth for Drains varies with different soils, 3ft. to 4ft. from the surface being that generally adopted. Glazed and common pipes are both largely used. The former are the most expensive, but are very strong, and best suited for mains. These should be fitted together closely, and, if laid near trees, the joints cemented, to prevent roots from entering and eventually choking them. Draining, to be effective in its results, must be systematically carried out, and each pipe inserted firmly in its proper position. A covering of stones, broken bricks, or similar material, placed over them before filling in the soil, will greatly assist the percolation of water. Some persons prefer laying the main and branches at the same time, thus finishing all as they proceed. This is immaterial, if all the levels have been previously properly obtained. It is, however, safest to insert the main Drain first, as a failure in its action will cause the whole to be useless. In either case, the work should be commenced at the highest point from the outlet, afterwards proceeding with a regular fall towards it. An ordinary spirit level, fixed in a long straight-edge, will indicate at once the fall in that distance, supposing the Drain is not too deep to admit of the bubble being seen. Where the ground is nearly flat, the spirit level is frequently used on each pipe; and, on the other hand, where the incline is certain, the fall may be easily seen by the eye.

DRAKÆA (named in honour of Miss Drake, botanical artist for the "Botanical Register"). ORD. *Orchideæ.* A genus comprising three species of extremely curious Australian greenhouse terrestrial Orchids. *D. elastica* bears a solitary flower, resembling an insect, suspended in the air, and moving with every breeze; the stalk sup-

Drakæa—*continued.*

porting same is slender, and about 1½ft. long. *D. ciliata* and *D. irritabilis* have several flowers on a stem. They thrive in a compost of peat, loam, and rough sand. Propagated by divisions.

DRAWING, or **DRAWN.** A term applied to plants whose growth has been unnaturally hastened by overcrowding, or being placed too far from the glass. Soft-wooded plants, or young shoots, often become Drawn in consequence of insufficient air and light, or an excess of heat and moisture. Such a condition is always to be avoided, as solidity of growth is impossible, and weakness in the plant follows as a matter of course.

DREPANOCARPUS (from *drepanon*, a sickle, and *karpos*, a fruit; in reference to the form of the pods, which are falcate). Sickle-pod. ORD. *Leguminosæ*. A genus comprising eight species of ornamental stove evergreen shrubs, all of which are natives of tropical America, and one of West tropical Africa also. They thrive best in a peat and loam compost. Cuttings of nearly ripe shoots, intact, root in sand, if placed under a glass, in bottom heat.

D. lunatus (half-moon-podded). *fl.* white; panicles terminal, ferruginous. *l.* impari-pinnate, with usually from five to nine nearly opposite oval-oblong leaflets; spines stipular, hooked. *h.* 6ft. to 10ft. Tropical America and Western Africa, 1792.

DRESSING. A term applied both to the renovation by digging, and the incorporation of manure for enriching, the ground. Top-dressing is the operation of spreading manure, &c., over the surface, whilst the plant or crop is in a growing condition.

DRILLING. A term applied to the plan of sowing small seeds in the open ground, in drills or shallow trenches usually made with a hoe. The ground should first be raked rather fine, and a line laid the required distance, and strained tight. The workman must then walk on the ground and make a trench next the line with the end of the hoe-blade. The depth may be regulated according to the size of the seed or the sorts. This method, for economy in seed sowing, is much superior to any other; for not only can the quantity at command be distributed more evenly, and the necessity of severely thinning the young plants thereby obviated, but weeding can be performed with every facility. Drills should be parallel to each other, and uniform in depth and distance apart.

DRIMIA (from *drimys*, acrid; the juice of the roots is so acrid as to cause inflammation when applied to the skin). SYNS. *Idothea* and *Idothearia*. ORD. *Liliaceæ*. A genus of greenhouse bulbous plants. They require a mixture of sandy loam and leaf mould, or peat soil, and, when not in a growing state, water should be almost entirely withheld. There are over a dozen species, all natives of tropical and Southern Africa; the few in cultivation are rarely met with, except in botanic gardens. None of them can fairly be called showy plants. For other species, formerly included here, *see* **Scilla.**

DRIMIOPSIS (from *Drimia*, and *opsis*, resemblance). ORD. *Liliaceæ*. A genus of about six species of little-known greenhouse bulbous plants, not unlike *Drimia*, and requiring similar treatment. Flowers usually greenish-white. The following species are most worthy of cultivation:

D. Kirkii (Dr. Kirk's).* *fl.*, perianth white, ¼in. long; segments oblong, obtuse, slightly cucullate at the tip; raceme 3in. to 4in. long, the upper flowers crowded; those of the lower half looser, many of the uppermost abortive; scape terete, 1ft. or more long. July. *l.* contemporary with the flowers, lanceolate, 1ft. long, acute, narrowed to the base, pale green on the upper surface, with large irregular blotches of dark green, still paler beneath. Bulb globose, 1½in. in diameter, with thin whitish truncate tunics. *h.* 9in. Zanzibar, 1871. A very curious plant. (B. M. 6276.)

D. maculata (spotted). *fl.* twelve to twenty, a few of the lowest often lax and abortive; perianth at first milk-white, but changing to greenish-white as it matures; scape terete, 8in. to 12in. long. *l.* cordate-ovate, fleshy-herbaceous, acute, the upper surface bright green, blotched with deeper green. Bulb globose, the upper half

Drimiopsis—*continued.*

emergent and squamose. *h.* 9in. to 1ft. Cape Colony, 1851. An ornamental and interesting plant, flowering freely when grown in a warm, airy house, and kept near the light. (Ref. B. iii. 191.)

DRIMOPHYLLUM. A synonym of **Umbellularia** (which *see*).

DRIMYS (from *drimys*, acrid, or *drimytes*, sharpness; referring to the taste of bark). SYN. *Wintera*. Including *Tasmannia*. ORD. *Magnoliaceæ*. A genus of five species, one of which is South American, two Australasian, and one each from New Zealand and Borneo. Fine evergreen half-hardy trees, with aromatic bark, and axillary and terminal flowers. *D. Winteri*, the species most frequently seen in cultivation, grows freely, but requires a little management in training, and the long branches will need cutting back. It succeeds out of doors when planted in sandy loam against a wall, if the winters are not severe. Propagated by cuttings, made of half-ripened shoots, inserted under a glass, in a cold frame.

D. aromatica (aromatic). *fl.* white, pink, dicœcious; sepals three, very concave; petals six, in two rings, or occasionally eight. April. *fr.* globose, sub-didymous. *l.* oblong, gradually tapering at base along the petiole, light green, distinctly marked with transparent dots, veinless on the under side. *h.* 9ft. to 12ft. Tasmania, 1843. Every part of the plant is highly aromatic and pungent to the taste. The fruit is occasionally used as pepper. (B. R. 1845, 43, under name of *Tasmannia aromatica*.)

D. Winteri (Winter's).* *fl.* milk-white, 1in. or more across, with a Jasmine-like perfume; petals eight to twelve; peduncles almost simple, aggregate, divided into elongated pedicels. *l.* oblong, obtuse; under surface glaucous. *h.* 25ft. South America, 1827. SYN. *Wintera aromatica*. (B. M. 4810.)

DRIMYSPERMUM. A synonym of **Phaleria.**

DROPWORT. *See* **Spiræa Filipendula.**

DROSERA (from *droseros*, dewy; the plants appear as if covered with dew, in consequence of being beset with glandular hairs). Sundew. ORD. *Droseraceæ*. A genus of about a hundred species of annual or perennial glandular (very rarely glabrous) herbs, sometimes bulbous. They are small-growing, but very beautiful, plants, of insectivorous notoriety. Some of the species, too, are climbers. Droseras are scattered over most parts of the world, and usually prefer marshy places. Some, however—several Australian kinds especially—grow in the driest ground, where their bulbous roots remain dormant for the greater part of the year, reviving with the first rains. Flowers in scorpioid revolute cymes, rarely solitary. Leaves ornamented with reddish irritable glandular hairs, discharging from their apices a drop of viscid, acrid fluid. Droseras are of easy culture, and the majority of those in cultivation thrive in a compost of living sphagnum and a little peat. Plenty of drainage is essential, and the pots in which they are grown should be stood in a pan of water. Thorough exposure to the light is also important. Propagated by seeds, which should be sown so soon after gathering as possible. *D. binata*, which is, of the exotic species, mostly grown, was formerly increased by the tedious method of sub-divisions of the crowns. It is now found, however, that roots taken from strong plants, and cut into pieces of ½in. or 1in. in length, will serve the purpose admirably. These are laid on the surface of shallow earthenware pans, in sandy peat soil, and covered about ¼in. deep with the same material. They are then placed under a bell glass, and transferred to a damp, warm propagating house. In the course of a fortnight, swellings begin to appear on the surface of the detached roots, which increase in length till they reach the top of the soil. This generally takes place about five weeks after being put in. When about 2in. or so in height, they are separated, and put into small pots, in similar soil to that into which the roots were originally placed, with the addition of some chopped sphagnum. If carefully attended to, they soon make excellent plants. All the species (even the British ones, which, as a matter of course, are perfectly hardy) do well treated as greenhouse plants.

Drosera—*continued.*

FIG. 683. FLOWERS AND LEAF OF DROSERA FILIFORMIS.

D. binata (twin-leaved).* *fl.* pure white, large; raceme dichotomous. June to September. *l.* all radical, on long footstalks, deeply parted with two linear lobes. *h.* 6in. Australia, 1823. Plant stemless. SYN. *D. dichotoma* (of gardens). (B. M. 3082.) Perennial.

D. capensis (Cape). *fl.* purple; scape rather ascending, somewhat hairy, longer than the leaves. June, July. *l.* sub-radical, oblong-linear, obtuse, tapering at the base; footstalks glabrous, shorter

FIG. 684. DROSERA ROTUNDIFOLIA.

Drosera—*continued.*

than the limbs of the leaves. *h.* 6in. Cape of Good Hope, 1875. Perennial. (B. M. 6583.)

D. dichotoma (dichotomous). A synonym of *D. binata.*

D. filiformis (thread-formed).* *fl.* purple, large; scapes erect, hardly equal in length to the leaves. June to August. *l.* filiform, very long, from a bulb-like base or corm; footstalks woolly at the base, much shorter than the leaves. *h.* 1ft. North America, 1811. See Fig. 683. (B. M. 3540.) Perennial.

D. lunata (crescent-leaved). *fl.* yellow; racemes lateral, few-flowered; sepals ovate, acute, beset with glandular hairs on the margins. July and August. *l.*, radical ones roundish-reniform; cauline ones scattered, stalked, moon-shaped, peltate. Stem erect, glabrous. *h.* 6in. Nepaul. A very beautiful annual plant, rarely seen in cultivation.

D. pauciflora (few-flowered). *fl.* white; scapes beset with glandular hairs, one or two-flowered. July, August. *l.* ovate-oblong, tapering at the base. *h.* 3in. Cape of Good Hope, 1821. Perennial.

D. peltata (peltate).* *fl.* pink, racemose. *l.* spaced along an elongated stem, forming minute flattened cups with the footstalks attached, not to one margin, but to the bottom; the inner surface and the edges of the cups are studded with tentacles. *h.* 1ft. Australia. Annual. (G. C. n. s., xix. 436.) There are two varieties of this species: *foliosa*, with white flowers; and *gracile*, with pink.

D. rotundifolia (round-leaved).* *fl.* white; scapes erect, four or five times higher than the leaves. July, August. *l.* orbicular; footstalks hairy, longer than the limb. The whole disk of the leaf, but especially its margin, is beset with red inflexed hairs. *h.* 4in. Northern hemisphere (Britain). Annual. See Fig. 684. Other native species are: *anglica* and *intermedia.*

D. spathulata (spathulate-leaved).* *fl.* purple, almost sessile, disposed in short racemes; scape glandular at the top, as well as the calyces. July. *l.* oblong-spathulate, tapering somewhat into the footstalk. *h.* 3in. Australia, 1861. Perennial. (G. C. n. s., xvi. 852.)

D. Whittakeri (Whittaker's). *fl.* white. Australia, 1862. A very rare species, much resembling *D. spathulata* in habit, but more erect. It is a deciduous form, and requires a long rest. Before starting into new growth, it must be taken out of the old soil and repotted. Perennial.

DROSERACEÆ. An order containing six genera and upwards of a hundred species, closely allied to *Saxifrageæ*. Perennial and annual glandular herbs, rarely shrubby below. Sepals four to eight, persistent; petals four to eight; stamens four to twenty. Leaves variable, radical and rosulate, or cauline and alternate, circinate in bud, stipulate. Most of the species are found inhabiting marshy places. Illustrative genera are: *Dionæa*, *Drosera*, and *Drosophyllum.*

DROSOPHYLLUM (from *drosos*, dew, and *phyllon*, a leaf; in allusion to the leaves being beset with stipitate glands, appearing like dew). ORD. *Droseraceæ*. A remarkable and very pretty sub-shrubby greenhouse plant, thriving in a light sandy loam. Propagated by seed. It should he kept somewhat dry, and no shading will be needed.

D. lusitanicum (Portuguese).* *fl.* yellow, large, disposed in a corymb at the top of a leafy stem, which attains 1ft. in height. Summer. *l.* elongate, linear, attenuated, circinate and revolute in vernation. Stem thick, woody, 2in. to 3in. high, at the top of which are the leaves. Spain, Portugal, and Africa, 1869. This—one of the most singular plants of the European flora—inhabits sandy shores and dry rocks by the sea and inland. The nature of the glandular hairs is different from that of the Droseras; their rigid pedicels not being endowed with the motive power of the British and other species of the genus just mentioned. "A still more anomalous character is to be found in the way the leaves are developed in the bud, being circinate and *revolute*, not involute, as in our Droseras, in Ferns, Cycads, and other plants; and of this mode of development *Drosophyllum* is, in so far as I know, the only example in the vegetable kingdom" (J. D. Hooker). (B. M. 5796.)

DRUMMONDIA. *See* **Mitella.**

DRUPACEÆ. Formerly regarded as a distinct natural order, but now as a section of *Rosaceæ*. The principal characters relied on to distinguish it reside in the fruit, which is a drupe, with a hard endocarp.

DRUPE. A succulent or fleshy fruit, consisting of a hard-shelled seed, as in Olive, Plum, and Cherry.

DRYANDRA (named after Jonas Dryander, a distinguished Swedish botanist; born 1748, died 1810). ORD.

Dryandra—*continued.*

Proteaceæ. A genus of about fifty species of handsome greenhouse evergreen shrubs, allied to *Banksia*, from which genus it is readily distinguished by the involucre, by the flat, or nearly flat, receptacle, and by the fruit. All are confined to Western extra-tropical Australia. They are very rarely seen in cultivation, notwithstanding their great beauty. For culture, *see* **Banksia.**

D. armata (armed).* *fl.-heads* yellow, terminal, closely surrounded by floral leaves longer than the flowers; involucre broadly ovoid or almost globular, ⅔in. long; bracts at first villous, at length becoming glabrous; perianth above 1in. long, more or less villous; limb narrow, obtuse. *l.* 2in. to 3in. long, deeply pinnatifid with lanceolate or triangular pungent-pointed lobes, very rigid, flat or undulate, reticulately veined, and sometimes slightly tomentose beneath. Young branches tomentose. *h.* 2ft. to 4ft. 1803. SYN. *D. favosa.* (B. M. 3236.)

D. blechnifolia (Blechnum-leaved). A synonym of *D. pteridifolia.*

D. falcata (falcate). This closely resembles *D. armata* in foliage and inflorescence, but may be distinguished from that species by the glabrous perianth limb. Young branches usually tomentose and hirsute, with spreading hairs. *h.* 4ft. to 5ft. SYN. *Hemiclidia Baxteri* (under which name it is figured in B. R. 1455).

D. favosa (honeycombed). A synonym of *D. armata.*

D. nervosa (nerved). A synonym of *D. pteridifolia.*

D. nivea (snowy).* *l.*, upper side deep green, snowy-white beneath, 4in. to 8in. long, linear, pinnate, divided almost or quite to the midrib into numerous regular triangular segments. *h.* 2ft. to 3ft. 1805. A very ornamental foliage plant.

D. plumosa (feathery).* *l.* dark green on the upper side, pure white beneath, dense, linear-elongate, pinnatifid, 5in. to 10in. long and about ½in. broad. *h.* 3ft. 1803. A remarkably elegant plant for table decoration when in a young state.

D. pteridifolia (Pteris-leaved).* *fl.-heads* yellow, large, terminal, closely surrounded by long floral leaves; involucre hemispherical; bracts densely villous, the outer ones ovate, the inner ones lanceolate; perianth silky or loosely villous with long hairs. *l.* pinnately divided almost or quite to the midrib into numerous linear or lanceolate straight or falcate segments, ¾in. to 1½in. or even 2in. long, often distant, but usually dilated at the base and frequently confluent, all with recurved or revolute margins, more or less tomentose underneath. Stems very short and thick, densely tomentose and villous. *h.* 1½ft. SYNS. *D. blechnifolia* and *D. nervosa* (B. M. 3063). (B. M. 3500.)

D. seneciifolia (Senecio-leaved). *l.* deep green above, greyish-white beneath, linear, pinnatifid, 3in. to 4in. long; lobes very small, triangular. *h.* 2ft. to 3ft. Very desirable.

DRYAS (mythological; from *Dryades*, or nymphs of the Oaks; the leaves bear some resemblance to those of the Oak). ORD. *Rosaceæ*. A genus containing a couple of species of elegant dwarf hardy shrubby plants, natives of cold and Arctic regions of the Northern hemisphere. Flowers white or yellow, large. Leaves simple, petiolate, oblong, entire, crenate or sub-pinnatifid; margins recurved, shining above, downy beneath. They are of easy culture in a moist peat soil. Propagated by cuttings, by divisions, or from seed.

D. Drummondi (Drummond's).* *fl.* golden-yellow, about 1in. across; calyx covered with blackish glandular hairs. June. *l.* elliptic, rather attenuated at the base, deeply crenated, clothed with white tomentum beneath and on the scape. North America, 1800. A rare evergreen trailer. (B. M. 2972.)

D. octopetala (eight-petaled).* Mountain Avens. *fl.* white with yellow stamens, about 1in. or more across, solitary on erect peduncles. June. *l.* obovate or sub-cordate, crenately serrated, white and downy beneath. Northern hemisphere (Britain). (Sy. En. B. 459.)

DRYMODA (from *drymodes*, woody; plants epiphytal on branches of trees). ORD. *Orchideæ*. A genus which contains—so far as is at present known—only the species described below. It is one of the smallest and most curious of Orchids, and, until it flowered at Kew in 1871, was only known by a drawing made by Griffiths in the Malayan Peninsula, in 1835. It grows in a warm house, on pieces of hard wood to which the bark remains attached.

D. picta (painted). *fl.* solitary, surmounting a slender scape 1in. to 1½in. long, proceeding from the rhizome under the preceding bulb; ⅔in. long from the dorsal sepal to the lip, inclined or horizontal; dorsal sepal small, acute, yellow-green; lateral sepals yellow-green, with dull purple bands forming wings at the apex of a long, curved, green, purple-spotted stipe, which projects from the base of the column; the latter furnished with two long yellow purple-spotted wings. Pseudo-bulbs clustered, discoid, dull green, with a minute central mammilla from which springs a very deciduous leaf. Moulmein, 1871. (B. M. 5904.)

DRYMOGLOSSUM (from *drymos*, a wood, and *glossum*, a tongue; alluding to the place of growth and the form of the fronds). Wood Tongue Fern. ORD. *Filices*. A genus of small creeping stove Ferns. Fronds dimorphous. Sori as in *Tænitis*. For culture, *see* **Ferns.**

D. carnosum (fleshy). *rhiz.* wide-creeping, filiform. *fronds*, barren ones sub-orbicular or elliptical, 1in. to 2in. long, ⅔in. broad; fertile ones linear-spathulate, 2in. to 3in. long, ⅓in. broad, both narrowed to the base. *sori* in a line midway between the edge and midrib; when young, covered with stalked peltate scales. East Himalayas.

D. c. subcordatum (sub-cordate). A variety having smaller fronds (the barren ones roundish, sub-sessile), thinner texture, and the sori nearer the midrib. China and Japan.

D. piloselloides (Pilosella-like). *rhiz.* filiform, creeping. *fronds*, barren ones roundish, ½in. to 2in. long, ½in. to ⅔in. broad; fertile ones linear-oblong, 2in. to 4in. long, ⅓in. to ½in. broad; both are narrowed to the base. *sori* in a broad continuous submarginal line; the capsules mixed with stellate paraphyses. East Indies, &c., 1828. (H. G. F. 46.)

D. rigidum (rigid). *fronds*, barren ones 1in. to 1½in. long, half as broad, obovate, entire, with thickened edges, on firm erect stems 1in. long; the fertile ones 4in. to 5in. long, ⅓in. broad, narrowed into a stem about as long as itself. *sori* in a deep groove between the broad midrib and edge. Borneo.

DRYMONIA (from *drymos*, an Oak wood, in allusion to the plant growing on trees in woods). ORD. *Gesneraceæ*. Stove prostrate radicant shrubs, or climbing upon trees. Flowers whitish or yellowish, on short axillary peduncles, often solitary. Leaves opposite, serrated, petiolate. There are about fourteen species, all natives of the tropical parts of the Western hemisphere. For culture, *see* **Besleria.**

D. bicolor (two-coloured). *fl.* purple; calyx large, green; limb of corolla sharply serrulated. *l.* oblong, acuminated at both ends, hairy, toothed. West Indies, 1806. Climbing shrub. (B. R. 1838, 4.)

D. marmorata (spotted).* *fl.* creamy-white, axillary, fimbriated. *l.* large, opposite, 6in. long by 3½in. wide, dark green, with the convex portions between the veins of a glistening-grey; margin crenate; under surface purplish; petioles long, reddish. Guiana (?). An erect-growing species, with obscurely tetragonal stems. (B. M. 6763.)

D. punctata (spotted-flowered). *fl.* yellow, violet. May. Guatemala, 1843. Evergreen climber. (B. M. 4089.)

D. Turialvæ (Turialva).* *fl.* white, large, pendulous; lower lobe toothed and lip-like; calyx of a dull red colour; racemes axillary. *l.* broadly ovate, bullate, of a beautiful metallic shade. Veragua, 1870. A tall sub-shrubby plant. (I. H. 1869, 603.)

DRYMOPHLOEUS (from *drumos*, wood, and *phloios*, bark; application not stated). ORD. *Palmeæ*. A genus of about a dozen species of unarmed stove palms, with slender ringed trunks, natives of New Guinea, tropical Australia, and the Pacific Islands. Flowers monœcious, in branched panicles; spadices springing from the trunk below the crown of leaves. Leaves terminal, regularly pinnatisect; segments cuneate-oblong or linear. For culture, *see* **Ptychosperma.**

D. oliveæformis (Olive-formed). *fr.* olive-shaped, reddish. *l.*, segments cuneate-oblong, erose-dentate at the apex; terminal one larger, fan-shaped. Stem 20ft. to 30ft. high, 3in. to 4in. thick. Moluccas. SYN. *Ptychosperma Rumphii.*

D. ceramensis, *D. Rumphii*, and *D. singaporensis* are also in cultivation.

DRYNARIA. *See* **Polypodium.**

DRYOBALANOPS (from *drys*, a tree, *balanos*, an acorn, and *ops*, appearance; in allusion to the species being a tree bearing acorn-like fruits). Camphor-tree. ORD. *Dipterocarpeæ*. A large resinous camphor-bearing stove evergreen tree, native of Sumatra.

D. aromatica (aromatic). *fl.* yellow, in panicles. *l.* obtusely acuminated, elliptic, entire, coriaceous, shining. *h.* 100ft. This tree furnishes a liquid called Camphor Oil, and a crystalline solid known as Sumatra Camphor. It is highly prized by the Chinese.

DRYOPTERIS. *See* **Nephrodium.**

DRYOSTACHYUM. *See* **Polypodium.**

DRYPETES (from *drypto*, to lacerate; referring to its spiny nature). ORD. *Euphorbiaceæ*. A genus of about nine species of ornamental stove evergreen shrubs, natives of Brazil, the West Indies, and Florida. They thrive in a compost of peat and loam. Cuttings root in sandy loam, if placed under a glass, in heat.

D. crocea (saffron-coloured). *fl.* orange. June. *l.* alternate, oval or elliptical, pointed, coriaceous. *h.* 6ft. West Indies, 1820. SYN. *Schæfferia lateriflora.*

DRYPIS (the old Greek name used by Theophrastus, from *drypto*, to tear, on account of the leaves being armed with stiff spines). ORD. *Caryophylleæ*. A very pretty little herbaceous perennial, admirably adapted for ornamenting rockwork, where it becomes suffruticose, and produces an immense number of flowers. Increased either by cuttings, placed in sandy soil, under a hand glass; or by seeds, sown in a light compost. When seedlings are of sufficient size, they should be separated and planted on the top of rockwork, care being taken to keep them watered until fresh roots are emitted.

D. spinosa (prickly).* *fl.* pale pink or white, corymbose; bracts with three teeth on each side. June. *l.* stiff, awl-shaped, somewhat trigonal, mucronate. Stems at first procumbent, four-sided; flowering stems erect. *h.* 6in. South Europe, &c., 1775. (B. M. 2216.)

DRY-ROT. A name given to decayed timber, caused by different species of Fungi, which, under certain conditions, attack woodwork in ships, houses, &c., penetrating the wood in all directions, and in many instances doing irreparable damage before they are observed. Two of the principal species of Fungi causing Dry-rot are: *Merulius lacrymans*, attacking wood in houses and other buildings; *Polyporus hybridus*, affecting oak-timber in ships.

DUBOISIA (named after Louis Dubois, author of several botanical works). ORD. *Solanaceæ*. A small, glabrous, greenhouse tree. It thrives in sandy loam and peat. Cuttings strike readily under a bell glass.

D. myoporoides (Myoporum-like). *fl.* white, in axillary clusters; calyx two-lipped; corolla funnel-shaped, the limb five-parted. Berry indehiscent. *l.* entire. *h.* 6ft. to 15ft. New South Wales, &c.

DUBREUILIA. A synonym of **Pilea.**

DUCKMEAT, or DUCKWEED. *See* **Lemna.**

DUCK'S FOOT. *See* **Podophyllum.**

DULCAMARA. *See* **Solanum Dulcamara.**

DUMASIA (named in honour of M. Dumas, one of the editors of "Annales des Sciences Naturelles"). ORD. *Leguminosæ*. A genus of three species of ornamental greenhouse evergreen twiners. Flowers yellow, disposed in axillary racemes. Leaves pinnately trifoliolate, stipellate. For culture, *see* **Clitoria.**

D. villosa (villous). *fl.* yellow; racemes axillary. August. *l.*, leaflets ovate. Branches, petioles, peduncles, and leaves pubescent. Tropical Asia, &c., 1824. (B. R. 961.)

DUMB CANE. *See* **Dieffenbachia Seguine.**

DUMERILIA (of Lessing). A synonym of **Perezia.**

DUPERRYA. A synonym of **Porana.**

DURAMEN. Heartwood. That part of the timber of a tree which becomes hardened by matter deposited in it. It is next the centre in Exogens, and next the circumference in Endogens.

DURANTA (named in honour of Castor Durantes, a physician and botanist, who died in 1590). ORD. *Verbenaceæ*. A genus of four or five species of rather pretty free-flowering stove evergreen shrubs, with blue flowers. Probably the only one in cultivation is *D. Plumieri*. All are natives of the Western hemisphere. Cuttings strike readily in heat, and should be inserted early in spring, and the young plants afterwards crown on in a stove temperature, using for potting a gompost of peat and loam in equal proportions.

Duranta—*continued.*

D. Ellisia (Ellisia). A synonym of *D. Plumieri.*

D. Plumieri (Plumier's).* *fl.* pretty blue, borne in great profusion in racemes towards the ends of the branches; calyces in fruit twisted. August. *l.* oblong-lanceolate, acuminate. Branches spinose. *h.* 6ft. to 15ft. South America and the West Indies, before 1739. SYN. *D. Ellisia.* (B. M. 1759.)

DURIO (*Duryon* is the name of the fruit in the Malay language, and comes from *dury*, a thorn; alluding to the prickly fruit). ORD. *Malvaceæ*. A large stove evergreen tree, the fruit of which is about the size of a man's head, and, by those who have overcome its civet odour and turpentine flavour, is ranked among the most delicious of Indian fruits. The only species of the genus thrives well in a compost of peat, loam, and leaf mould. Cuttings of firm young shoots root readily in spring, in sand, if placed under a glass, and in bottom heat.

D. zibethinus (civet). *fl.* white. *l.* oblong, acuminated, rounded at the base, of a lurid-silvery colour beneath, where they are covered with brownish scales. *h.* 80ft. 1825. Native of Malaya and the Indian Archipelago. The fruit of this plant is used, when in a decomposed state, as a bait to trap the civet-cat; hence the specific name.

DUTRA. *See* **Datura.**

DUVALIA (named after H. A. Duval, of Paris, author of "Enumeratio Plantarum Succulentarum in Horto Alenconio"). ORD. *Asclepiadeæ*. A genus of succulent Stapelia-like plants, all natives of South Africa. Corolla with the segments more or less replicate, and an elevated annulus (orb) on the disk; outer corona flat, entire, pentagonal, disk-like; inner corona of five small, entire, horizontal, ovoid, pointed, fleshy segments, somewhat resembling a bird's head when viewed sideways. The species mentioned below are among the most distinct. For culture, *see* **Stapelia.**

D. Corderoyi (Corderoy's).* *fl.* olive-green, with darker tips, or dull reddish-brown, 1½in. to 2in. in diameter; lobes of corolla lanceolate-acuminate, fringed with clavate mauve-purple hairs; annulus clothed with soft hairs of the same colour. Branches sub-globose, crowded, flowering at their sides. (B. M. 6082.) SYN. *Stapelia Corderoyi.*

D. elegans (elegant). *fl.* dark purple-brown, shining, small; corolla lobes ovate, shortly acuminate, shortly pilose on the surface and ciliate with soft dark purple hairs; annulus only slightly raised, giving the flower a flat look. Branches oblong or ovoid, crowded, flowering at their sides. (B. M. 1148.) 1795.

D. Jacquiniana (Jacquin's). *fl.* dark purple-brown, opaque, small; corolla lobes lanceolate, acute, strongly replicate, glabrous, but ciliate with simple or slightly clavate hairs. Branches oblong, crowded, flowering at their sides. 1802.

D. polita (polished).* *fl.* three or four together, opening successively; pedicels about 1in. long, glabrous; corolla 1in. in diameter; lobes ovate-acuminate, erect-spreading, a little recurved at the apex, brownish-purple, very smooth and polished, the margins very slightly folded back and fringed towards their base with long purple vibratile, clavate, purple hairs; annulus minutely scabrid, paler than the lobes, and opaque; outer corona chocolate-red, or dark purplish-red; processes of inner corona dull orange. Summer. Stems and branches elongate, 2in. to 3in. long, about ¼in. thick, somewhat clavate, more or less decumbent and rooting, glabrous, dull green or purplish, six-angled; angles obtuse, toothed. 1874. One of the finest plants of the genus. (B. M. 6245.)

DUVAUA (named in honour of M. Aug. Duvau, a French botanist, publisher of the original edition of Richard's "Démonstrations botaniques, ou analyse du fruit considéré en général"). ORD. *Anacardiaceæ*. Handsome half-hardy evergreen shrubs, with bright shining foliage. Flowers yellowish; racemes axillary, short, many-flowered, solitary or fasciculated. Leaves simple, alternate, exstipulate. There are four species, natives of extra-tropical South America. They thrive in a dry and sandy soil and in a sheltered situation, having its surface sloping to the south. Cuttings, made of the ripe wood, root, if inserted under a bell glass, in gentle heat.

D. dependens (hanging). *fl.* yellowish-white; racemes axillary, scarcely exceeding the leaves in length. June, July. Berries black. *l.* mostly obovate, and very obtuse, or even emarginate, with scarcely any denticulations. *h.* 10ft. to 12ft. 1790. Usually grown as a wall shrub. (B. R. 1573.)

Duvaua—*continued.*

D. latifolia (broad-leaved). *fl.* greenish-white; racemes dense, the length of the leaves. June, July. Berries black. *l.* oblong, acute, coarsely toothed, so waved as to seem in some measure plicate. *h.* 6ft. to 12ft. 1826. (B. R. 1580.)

D. ovata (ovate). *fl.* yellowish-white; racemes a little longer than the leaves. June. Berries black. *l.* ovate, toothed, mostly acute at the tip, some obtuse. *h.* 6ft. to 10ft. 1825. (B. R. 1568.)

DWALE. *See* **Atropa Belladonna.**

DWARF CYPRESS. *See* **Chamæcyparis.**

DWARF ELDER. *See* **Sambucus Ebulus.**

DWARF FAN-PALM. A common name of **Chamærops humilis** (which *see*).

DYCKIA (named after Prince Salm-Dyck, a German botanist, and author of a splendid work on succulent plants). ORD. *Bromeliaceæ.* A genus of greenhouse succulents, with elegant foliage and ornamental habit of growth, usually stemless. There are about half-a-dozen species, natives of Brazil. They are best grown with Agaves, and thrive well in a mixture of two parts loam, and one part vegetable mould, to which a little sand may be added. Perfect drainage is essential, and water must be liberally applied during summer; but in winter, a very small quantity will suffice. Propagated by suckers.

D. argentea (silvery).* *l.* long, rigid, rosulate, recurved, lying very close together, about 2ft. long, and rather less than 1in. broad, tapering to a point, toothed at the edges; both surfaces densely covered with white scales, and thus imparting a covering like hoar-frost. A rare species.

D. brevifolia (short-leaved). *fl.* yellow; spike about 1ft. long. *l.* about thirty in a dense rosette, the young ones of the centre erect, the outer ones recurved; when fully mature, about 4in. long. 1869. (Ref. B. 236.)

D. frigida (cold). *fl.* orange-yellow, very numerous, nearly 1in. long; spike branched, covered with pale down. February. *l.* tufted, linear-lanceolate, spine-toothed, recurved, 1ft. to 2ft. long. 1877. SYN. *Pourretia frigida.* (B. M. 6294.)

D. rariflora (scattered-flowered). *fl.* orange, in spikes, with appressed membranaceous bracts. Summer. *l.* radical, lanceolate, pointed, narrow, rigid, recurved, greyish-green; margin with distant spines. *h.* 2ft. 1832. In warm, sheltered situations of rockwork, this very interesting species may be found useful. (B. M. 3449.)

DYER'S GREENWEED. *See* **Genista tinctoria.**

DYER'S ROCKET. *See* **Reseda Luteola.**

DYER'S WEED. *See* **Reseda Luteola.**

DYER'S YELLOW-WEED. *See* **Reseda Luteola.**

DYPSIS (from *dupto*, to dip; application not given). ORD. *Palmæ.* A genus of five or six species of unarmed dwarf stove Palms, all natives of Madagascar. Flowers monœcious, in branched panicles. Males with membranous, orbicular sepals, and ovate, acute, valvate petals; stamens six, the linear filaments connate at the base. Females smaller than the males, sub-globose, with membranous broadly imbricated sepals, and convolute imbricate petals. Spadices long, lax-flowered. Stems reed-like, surmounted by a crown of leaves, entire or bifid at the apex, or pinnatisect; segments cleft, or præmorsely dentate. The species in cultivation are: *Hildebrandtii, madagascariensis,* and *pinnatifrons.*

DYSODA. A synonym of **Serissa** (which *see*).

DYSODIA from *dusodes*, ill-smelling; in allusion to the unpleasant odour of some of the species). ORD. *Compositæ.* A genus of about ten species of erect or diffuse, glabrous or pubescent herbs, natives of Mexico and Central America. Flower-heads heterogamous, radiate; ray-florets female; disk fertile; involucre cylindrical, campanulate, or almost hemispherical, composed of one series of sub-equal, rigidly membranaceous bracts. Leaves opposite or alternate, more or less pinnatifid. The species thrive in well-drained loamy soil, in greenhouse temperature. Readily propagated by seeds, sown in spring; by division of the roots; or by cuttings.

Dysodia—*continued.*

D. grandiflora (large-flowered). *fl.-heads* rich deep orange. *l.* opposite, ovate, acuminate, inciso-serrate. *h.* 1ft. to 2ft. A handsome perennial. SYNS. *Clomenocoma montana, Comaclinium aurantiacum.* (B. M. 5310.)

D. pubescens (pubescent). The correct name of the plant described in this work as *Bœbera incana.*

E. In composition, this letter signifies without; thus, *ebracteate*, without bracts.

EARED. Auriculate; having ears or appendages.

EARINA (from *earinos*, the spring; in reference to the time of flowering). ORD. *Orchideæ.* A genus of about six species of epiphytal orchids, from the Pacific Islands and New Zealand. They have small flowers, crowded into sessile heads; the lateral sepals and foot of the column forming a chin. *E. mucronata* (sharp-pointed) and *E. autumnalis* (autumnal) are two greenhouse species, from New Zealand. For cultivation, *see* **Oncidium.**

EARTH. *See* **Soil.**

EARTHING-UP. A term used to represent the process of drawing the existing, or applying additional, soil in ridges round the stems of kitchen-garden crops, or other surface-rooting plants, requiring more space for the development of the leaves than for the roots. It is performed in this case in order to concentrate the soil where it is most required. Earthing-up round the stems of Celery and similar crops is practised mainly for the exclusion of light from the stems, and for the consequent blanching obtained. The plan is also frequently adopted in winter, for preserving the stems of plants from frost.

EARTH NUT, or **EARTH PEA.** *See* **Arachis hypogæa.**

EARWIGS (*Forficula auricularia*). These very destructive insects constitute an anomalous tribe, and are generally placed in the order *Dermaptera.* They are injurious, not only to many flowering plants, but also to ripe fruit. Amongst the latter, those most attacked are the Apricot and Peach. At certain times, Earwigs migrate from place to place in vast numbers; and this fact is sufficient to account for their extreme abundance at one season, and their scarcity at another. In the common

FIG. 685. EARWIG.

species (see Fig. 685), the beautiful wings are neatly folded under very short and truncate elytra; and at the end of the body are formidable forceps, for the purpose of folding and unfolding the large and fragile wings after, and previous to, flight. The Earwig is comparatively small, measuring only some three-quarters of an inch. Unlike most other insects, the female, after laying her eggs, does not leave them, but actually broods over them, as a bird does over its eggs, and even sits on the young ones after hatching. Disliking moisture, these pests are more commonly found in dry, hot positions than in damp ones. Among the young flower-heads of Chrysanthemums and Dahlias, and various other flowers, they commit great damage. There is no poisonous application that gives really good results; consequently, traps must be resorted to.

Traps. These are of numerous kinds, but for all practical purposes the following will be found sufficient. Beanstalks, or hollow stems of any suitable kind of plant, if cut into lengths of from 6in. to 9in., and placed amongst the infested plants, or in the branches of fruit-trees, will catch a large number. Flower-pots, partly filled with dry moss, and either inverted or laid on their sides, may also be

Earwigs—*continued.*

used effectively. In all cases, the traps must be frequently examined, and the enemy shaken out into a vessel containing boiling water.

EBENACEÆ. A natural order of trees or shrubs, containing about six genera and some 250 species, natives, for the most part, of warm regions. Flowers hermaphrodite, or staminate and pistillate; calyx three to seven-cleft, persistent; corolla three to seven-cleft. Leaves alternate, rarely opposite, entire, coriaceous, exstipulate. Some of the trees of this order furnish valuable timber, the heart-wood of several species constituting the ebony of commerce. The best-known genera are: *Diospyros*, *Euclea*, *Maba*, *Royena*, and *Tetraclis*.

EBENUS (from *ebenos*, ebony). ORD. *Leguminosæ*. A genus of about eight species of elegant little herbs or sub-shrubs, chiefly confined to the Mediterranean region and Asia Minor, though one species is found as far east as Beloochistan. Flowers pink, in dense spikes or round heads; peduncles axillary or terminal. Leaves usually unequally pinnate, made up of three to five pairs of lance-shaped leaflets, though in a few they are digitate or simple. For culture, &c., *see* **Anthyllis.**

E. cretica (Cretan). *fl.* reddish or purple, in ovate-cylindrical spikes; staminiferous tube elegantly striated. June, July. *l.* rarely trifoliolate, usually impari-pinnate, with two pairs of leaflets and an odd sessile one; leaflets oblong-linear; stipules connected, and therefore bifid at the apex and opposite the leaves. *h.* 1ft. to 2ft. Candia, 1737. Shrubby species. SYN. *Anthyllis cretica.* (B. M. 1092.)

E. pinnata (pinnate). A synonym of *E. Sibthorpii.*

E. Sibthorpii (Sibthorp's).* *fl.* in spherical spikes; corolla purplish, about equal in length to the calyx; bracts three or four, broad, ovate, appearing like an involucre at the base of each head of flowers. *l.* impari-pinnate, with four or five pairs of oblong-linear, mucronate leaflets; stipules distinct, acuminate, bifid. Stem clothed with adpressed pubescence. Mounts Atlas and Parnassus. Herbaceous. SYN. *E. pinnata.* (S. F. G. 740.)

EBERMAIERA (named in honour of Karl Heinrich Ebermaier, 1767-1825, a German writer on medicinal plants). ORD. *Acanthaceæ*. A genus of about thirty species of stove herbs, widely distributed throughout the tropical regions of both hemispheres. They require similar treatment to **Eranthemum** (which *see*).

E. nitida (shining). *fl.* white. *l.* glossy, convex. *h.* 4in. Brazil, 1879. A curious little plant, resembling *Fittonia* in habit. SYN. *Chamæranthemum nitidum.*

EBONY. *See* **Diospyros Ebenus.**

EBRACTEATE. Without bracts.

ECBALLIUM (from *ekballein*, to cast out; the seeds are violently ejected from the ripe fruit). Squirting Cucumber. ORD. *Cucurbitaceæ*. A hardy annual. For cultivation, *see* **Gourds.**

E. Elaterium (squirting). *fl.* yellow, on erect bracteate peduncles. June. *fr.* green, expelling the seeds when ripe. *l.* cordate, somewhat lobed, crenate-toothed, on long petioles. Stems dwarf, without tendrils. Mediterranean region, 1548. Plant scabrous, hispid, and glaucescent; trailer. The drug known as Elaterium (a powerful cathartic) is procured from this plant. SYN. *Momordica Elaterium.* (B. M. 1914.)

ECCREMOCARPUS (from *ekkremes*, pendent, and *karpos*, fruit; in allusion to the fruit). ORD. *Bignoniaceæ*. A genus of elegant half-hardy evergreen climbers. Flowers yellow, red, or golden, tubular, divided into five equal lobes. Leaves opposite, bipinnatisect, terminating in a branched tendril. Stem shrubby. *E. scaber* is a very popular plant, and proves perfectly hardy in sheltered situations, in the southern counties; also in more northern ones, when the winters are not exceptionally severe. They thrive in any light fertile soil. Seeds may be sown in March, in a gentle heat, and flowers will be produced during the latter part of the same year.

Eccremocarpus—*continued.*

E. longiflorus (long-flowered).* *fl.*, corolla yellow, with a green limb, tubular, a little arched; peduncles pendulous, opposite the leaves, many-flowered. July. *l.* opposite, abruptly bi-tripinnate; leaflets oval, entire, sessile. Peru, 1825.

FIG. 686. SPRAYS OF ECCREMOCARPUS SCABER in Flower and Fruit.

E. scaber (rough).* *fl.*, corolla scarlet or deep orange-red, with a ventricose throat; racemes opposite the leaves, pedunculate, secund, many-flowered. July, August. *l.* opposite, petiolate, abruptly bipinnate; leaflets alternate, obliquely cordate, ovate, serrated or entire. Stems angular, hairy. Chili, 1824. A useful plant for covering walls, trellises, and pillars. SYN. *Calampelis scabra.* See Fig. 686. (B. R. 939.)

ECHARDIA. A synonym of **Peristeria.**

ECHEVERIA. Included under **Cotyledon.**

FIG. 687. ECHINACEA PURPUREA INTERMEDIA, showing Habit and single Flower-head.

ECHIDNIUM (from *echidnion*, a young viper; in allusion to its relationship to *Dracontium*). ORD. *Araceæ*. A genus of a couple of species of stove tuberous-rooted perennials, included under *Dracontium* by Bentham and Hooker. For culture, *see* **Anchomanes.**

Echidnium—*continued.*

E. Regelianum (Regel's). *fl.* purplish-brown; spathe sub-erect; spadix cylindrical; peduncle partly adnate to the spathe. June. *l.* tripartite, deep green. *h.* 1½ft. to 3ft. Brazil, 1866. SYN. *E. Spruceanum*, of gardens. (R. G. 503.)

E. Spruceanum (Spruce's). A garden synonym of *E. Regelianum.*

ECHIDNOPSIS (from *echidne*, a viper, and *opsis*, appearance; alluding to the stems). ORD. *Asclepiadaceæ.* A greenhouse, fleshy, leafless, perennial herb. For culture, *see* **Stapelia.**

E. cereiformis (Cereus-like). *fl.* bright yellow, small, in fascicles; calyx tube hemispheric, with five triangular, acute, spreading and recurved lobes; corolla broadly rotate-campanulate. Stem elongated, cylindrical, obtuse, cernuous or pendulous, areolate. *h.* 6in. Abyssinia, 1871. (B. M. 5930.)

ECHINACEA (from *echinos*, a hedgehog; referring to the prickly scales of the receptacle). ORD. *Compositæ.* Ornamental hardy herbaceous perennials, with generic characters scarcely distinct from *Rudbeckia*, in which genus it is included by Bentham and Hooker. Echinaceas form excellent subjects for mixed borders and sub-tropical gardens. The species thrive best in warm, sunny situations, and in a compost of deep rich loam and leaf mould. They are readily propagated by divisions.

E. angustifolia (narrow-leaved).* *fl.-heads* light purple or rose, 4in. to 6in. across. Summer. *l.* lanceolate, hairy, 4in. to 6in. long, ½in. broad. Stem hairy below. *h.* 2ft. to 4ft. United States, 1861. (B. M. 5281.)

E. purpurea (purple).* *fl.-heads* reddish-purple, paling off at the tips to a greyish-green, about 4in. across; peduncle long, thick, rigid, producing a solitary terminal flower-head. Summer, autumn. *l.* roughish, obscurely dentate; radical ones ovate-lanceolate; cauline ones more lanceolate, tapering at the base. Stem smooth. *h.* 3ft. to 4ft. United States, 1799. (B. M. 2, under the name of *Rudbeckia purpurea.*)

E. p. intermedia (intermediate) comes very near *E. purpurea.* It differs principally in the more spreading ray-florets. *h.* 2ft. to 4ft. See Fig. 687. (P. M. B. xv. 79.)

E. p. serotina (late-flowering) is a hirsute or hispid form of *E. purpurea.* (L. B. C. 1539.)

ECHINANTHUS. *See* **Echinops.**

ECHINATE. Covered with prickles, like a hedgehog.

ECHINOCACTUS (from *echinos*, a hedgehog, and *Cactus*; plants beset with spines like a hedgehog). Hedgehog Thistle. ORD. *Cacteæ.* A large genus of simple, grotesque, fleshy, ovoid or globose, ribbed, leafless, succulent plants. Flowers usually rising from the fascicles of spines at the tops of the ribs; sepals numerous, imbricated, united into a short tube, adnate to the base of the ovary; outer ones bract-like; inner ones petaloid, elongated, spreading. About 200 forms have been described. They are dispersed from Texas and California to Peru and Brazil, but are most numerous in Mexico. For culture, *see* **Cactus.**

E. centeterius (many-spined). *fl.* deep straw-colour, with reddish streaks down the centre; nearly 3in. across; anthers yellow. July. Plant sub-globose; tubercles in fifteen nearly vertical series, confluent, oblong; areolæ oval, white, tomentose; outer ten prickles slender, central four stronger. *h.* 6in. Mexico, 1840. (B. M. 3974.)

E. concinnus (neat). *fl.* yellow. Spring. Plant globose, depressed, glaucescent, with about ten ribs, which are obtuse and sinuately crenated; areolæ remotish, woolly; spines setaceous, eight to ten, one of which is longer and stronger. *h.* 6in. Mexico (?), 1828. (B. M. 4415.)

E. corynodes (club-like). *fl.* rich sulphur-yellow, 2in. in diameter when fully expanded, several from the crown of the plant; tube externally shaggy with brown wool; petals in two or three rows, spathulate, crenate and almost laciniated towards the apex; stamens numerous, pale yellow, crowded around the style; stigma with the rays erect, bright scarlet. Summer. Plant sub-globose, but depressed at the top, and narrowed at the base, deep somewhat glaucous green. The sides are cut into about sixteen deep, vertical furrows, and as many prominent, crenated ridges; the crenatures are from ½in. to ¾in. apart, and in them is lodged a tuft of dense white wool, from which arise seven to nine spreading, rigid, pale brown spines, together with a central erecto-patent one, usually of a uniform deep brown colour. *h.* 2in. to 3in. Mexico (?), 1837. A very showy species. (B. M. 3906.)

E. crispatus (curled). *fl.* purplish. Summer. Plant obovate or sub-globose, truncate or depressed at summit; sides cut

Echinocactus—*continued.*

into about a score of vertical, narrow, undulated ridges; young areolæ with deciduous white tomentum; outer spines eight or nine, spreading, setaceous, white, with a brown point; four central ones reddish, much larger. See Fig. 688, for which we are indebted to Herr Fr. Ad. Haage, jun., of Erfurt.

FIG. 688. ECHINOCACTUS CRISPATUS.

E. Cummingii (Cumming's). *fl.* golden-yellow, 1in. in diameter, with a funnel-shaped tube, numerous, sessile. June. Plant nearly globose, greyish-green, contracted slightly at the base; tubercles about ½in. in diameter, arranged in spirals, sub-hemispherical; areolæ small, nearly circular; outer spines about fifteen to twenty, strict, slender, erecto-patent, pale yellowish, the upper rather the longest, central two or three shorter and stouter. *h.* 3in. Bolivia, 1847. (B. M. 6097.)

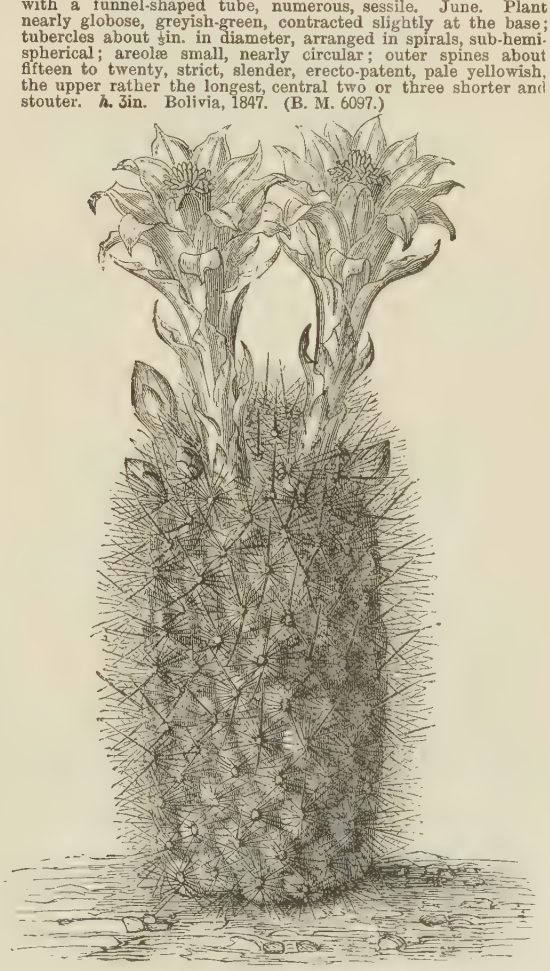


FIG. 689. ECHINOCACTUS HAYNII.

E. gibbosus (gibbous). *fl.* white. July. Plant roundish, deeply sixteen-angled; angles with a remarkable swelling below each parcel of spines. *h.* 6in. West Indies and Central America, 1808. (B. R. 137.)

Echinocactus—*continued.*

E. g. nobilis (noble). *fl.* white. July. Plant deep glossy olive-green, oblong, with fewer angles than in the type; angles and spines middle-sized, straight. *h.* 2ft. Mexico, 1796.

E. Haynii (Hayne's). *fl.* brilliant purple-red, very large. Stem cylindrical, light green; twenty-five or more ribs with rounded edges; areolæ small, oval, with pearly-grey tomentum; spines very numerous, greyish, with brown points. *h.* 6in. to 12in. Peru. See Fig. 689.

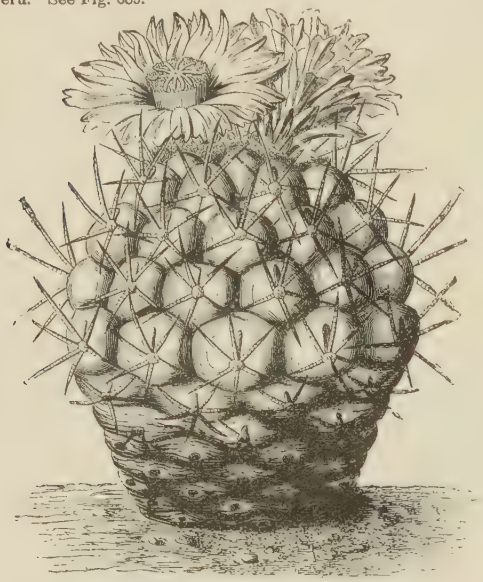


FIG. 690. ECHINOCACTUS HEXÆDROPHORUS.

E. hexædrophorus (hexædron-bearing). *fl.* white and pale red. June. Plant globose, glaucous, flat at top, tuberculate; tubercles hexædrous, disposed in two series, vertical and spiral; areolæ immersed, tomentose; spines four to seven, radiating, unequal, central one longer and stronger. *h.* 6in. North Mexico. See Fig. 690. (B. M. 4311.)

FIG. 691. ECHINOCACTUS LE CONTEI.

E. Le Contei (Le Conte's). *fl.*, petals lemon-yellow, with a brownish tint along the midrib. Plant ovate or cylindrical. Ribs twenty to thirty, compressed, sub-obtuse, interrupted; areolæ elongate-oblong; four principal central spines 2in. to 2½in. long; lateral ones more quadrangular. Mexico. A gigantic species, sometimes attaining a height of 5ft., and a diameter of 2ft. See Fig. 691, for which we are indebted to Herr Fr. Ad. Haage, jun.

E. longihamatus (long-hooked). *fl.* yellow. July. Plant sub-globose, green, thirteen-angled. Ribs strong, acutish areolæ large, oblong, shortly woolly; outer nine prickles straight, radiating, inner four strong, upper three straight; central one long, flattened, hooked. *h.* 3in. Texas and Mexico, 1836. (B. M. 4632.)

E. multiflorus (many-flowered). *fl.* white, large. July. Plant globose, rather glaucous, tuberculate, hardly ribbed; tubercles large, mammæform, disposed in an irregular vertical series; areolæ tomentose; prickles five, strong, recurved, nearly equal. *h.* 1½in. Probably native of Mexico. (B. M. 4181.)

Echinocactus—*continued.*

E. myriostigma (many-dotted). *fl.* pale straw-coloured, rising from the umbilicate top of the plant. July. Plant roundish-oblong, five or six-ribbed; ribs prominent; areolæ approximate, woolly, unarmed. *h.* 1ft. Mexico, 1843. SYN. *Astrophytum myriostigma.* (B. M. 4177.)

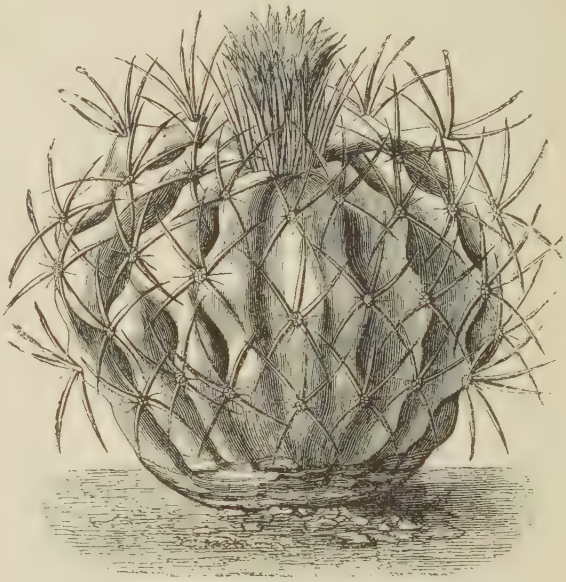


FIG. 692. ECHINOCACTUS OBVALLATUS.

E. obvallatus (fortified). *fl.* surrounded by numerous erect spines; petals purple, with a whitish border. Stem obovate, nearly globose, depressed at the summit, with about a score not very prominent vertical ribs. *h.* 4in. to 6in. South Mexico. See Fig. 692.

E. Ottonis (Otto's). *fl.* delicate lemon-colour, sessile, in threes or fours upon the summit of the stem, with bright red stigmas. July. Plant orbicular-cylindrical, contracted at the base, with about twelve vertical deep furrows; the ridges between the furrows obtuse, studded with rather closely-set small tufts of reddish wool; from these arise three or four rather strong spines, of a deep purplish-brown colour, which stand forward and are sometimes curved, and several lesser pale-coloured spreading ones. *h.* 3in. to 4in. Brazil, and probably also Mexico. (B. M. 3107.)

E. pectiniferus (pectinated).* *fl.* pale green, rose, solitary, two or more from the same crown, and springing from near the top: large for the size of the plant, very beautiful. April. Plant sub-rotund or ovate, rather suddenly contracted above the middle, depressed and even umbilicated at the top, deeply costate, with about twenty prominent costæ, which are obtuse and somewhat mammillose at the margins; in the centre of each mammilla is an oblong, white, woolly, close-placed areola, with numerous rather short spines, whose arrangement is very peculiar. They are of two kinds; the greater number spread out almost horizontally in two rows, closely placed in a pectinated manner, whitish or yellowish-white, tipped with red or brown, almost united at their base, the middle ones the longest; between these two rows are a few smaller ones. *h.* 4in. Mexico, 1844. A very showy species. (B. M. 4190.)

E. Pentlandi (Pentland's).* *fl.* large, in proportion to the size of the plant, springing from the sides upon the ribs, solitary, but three or four are expanded on one specimen at the same time; calyx tube green, becoming yellow above, and beset with small pilose and ciliated scales; limb of the calyx yellow-red; petals deep rose; stamens nearly white. July. Plant nearly globose, sessile, about 2in. across, depressed and umbilicate at the top, deeply marked with about twelve furrows and as many prominent obtuse ribs; glaucous-green. Ribs lobed or remotely crenate, distantly beset with little woolly tufts or areolæ (*pulvinuli*), from which rise about six slightly curved, spreading, rather stout spines, each ½in. long, or a little more. (B. M. 4124.)

E. Pfeifferi (Pfeiffer's). *fl.* yellow. Plant between cylindric and globular, about 1ft. high and 9in. in diameter; ridges 1½in. to 2in. deep, and 1½in. across at the base, triangular, deep green; spines in clusters 1in. apart, several, yellowish-white, rigid, about 1in. long. South Mexico.

E. rhodophthalmus (red-eyed).* *fl.* produced from the summit of the plant, large, handsome; calyx tube about 1in. long, ob-

Echinocactus—*continued.*

conical, quite destitute of spines or setæ; sepals or scales ovate, brown, with pale margins; petals bright rose, spreading, long, linear-spathulate, acute; stigma of nine or ten spreading bright yellow rays, covering the anthers. August. Plant sub-columnar, but tapering upwards almost from the base, deeply cut into about eight or nine furrows, the ridges obtuse, but formed into lobes or tubercles by transverse lines; areolæ furnished with obscure wool; spines about nine, strong, straight, tapering, flattened, at first deep purple, afterwards pale and almost colourless, mostly spreading, but the central one, which is much the longest and strongest, stands forward. *h.* 4in. to 5in. San Luis Potosi, Mexico, 1850. (B. M. 4486.)

FIG. 693. ECHINOCACTUS TEXENSIS.

E. Scopa (Broom). *fl.* yellow, with the petals, which are serrated at top, in two series. April. Plant oblong, many-ribbed; fascicles of spines approximate, woolly at base; outer spines white, twenty to forty, weak; central three or four, purple, stiff. *h.* 6in. Brazil, 1847. (B. R. XXV. 24.)

FIG. 694. ECHINOCACTUS VISNAGA.

Echinocactus—*continued.*

E. Simpsoni (Simpson's). *fl.* yellowish-green or purple, rather small, but numerous on the upper part of the stem. Plant dwarf, rarely exceeding 6in. to 8in. high, usually much less; tubercles loosely arranged, ½in. to ¾in. long, with several white spreading spines, and a central yellowish one. Colorado, 1876. Nearly or quite hardy. (Gn., April, 1877; G. C. n. s., vi. 293.)

E. texensis (Texan). *fl.* rose-coloured. Plants mostly depressed, sometimes globose; ribs from thirteen to twenty-four; areolæ ½in. long, and 1in. apart; spines from ½in. to 2in. long. North-eastern Mexico, &c. See Fig. 693, for which we are indebted to Herr Fr. Ad. Haage, jun.

E. tubiflorus (tube-flowered). *fl.* large, rising from one of the fascicles of spines; tube very long, a little enlarged upwards, brownish-green, scaly, each scale with a long tuft of slender, flaccid hairs; petals spreading, white, oblong, much acuminated. Plant sub-globose, much depressed, umbilicated at the top, and deeply cut into about eleven very prominent, compressed, slightly undulated angles, which have five or six woolly tubercles, each giving rise to a fascicle of six to eight strong black spines, from ½in. to ¾in. long. Mexico. (B. M. 3627.)

E. Visnaga (Visnaga, among the Mexican settlers, means a toothpick). *fl.* yellow, numerous. Plant large, elliptical, many-angled, with narrow sinuses and deep sinuated tubercled angles; top very woolly; areolæ approximate, rhomboid, immersed, glabrous, pale brown; prickles four, strong, central one 2in. long, the other three deflexed, shorter. *h.* 7ft. Mexico, 1847. A plant of this species, which measured 9½ft. in circumference, and weighed one ton, was an inmate of the succulent house at Kew, in 1846. From injury sustained during its conveyance to England, it did not long survive. See Fig. 694. (B. M. 4559.)

E. Williamsii (Williams's). *fl.* pale greenish-rose, small, nearly solitary. Spring. Plant tufted, depressed, glaucous, six to eight-ribbed; ribs broad, convex, tubercled, unarmed. *h.* 3in. Mexico 1845. (B. M. 4296.)

ECHINOCEREUS. *See* **Cereus.**

ECHINOCHLOA. *See* **Panicum.**

FIG. 695. ECHINOPS COMMUTATUS.

ECHINOPS (from *echinos*, hedgehog, and *ops*, appearance; in reference to the spiny scales of the involucre). Globe Thistle. SYN. *Echinanthus*. ORD. *Compositæ*. A rather large genus of ornamental, but somewhat coarse-growing, mostly hardy biennials or perennials, with a Thistle-like appearance. Inflorescence globose; florets white or blue, with an involucre of prickly scales and bristles. The cluster of heads or capitules is surrounded by an involucre of linear scales, thus completing the appearance of a single head. They are of very easy culture in common garden soil, and form excellent subjects for borders, or for naturalising in shrubberies. The biennials may be propagated by seed, sown in April; the perennials by division, in March.

E. banaticus (Banat). *fl.-heads* blue. Summer. *l.* roughish, pubescent above, downy beneath; radical ones pinnate; upper ones pinnatifid; lobes oblong, acuminated, spiny, slightly sinuated. *h.* 2ft. to 3ft. Eastern Europe, 1832. Slightly branching. Biennial.

E. commutatus (changed).* *fl.-heads* whitish. Summer. *l.* pinnatifid, rough with hairs on the upper side, downy beneath; margins with small spines. *h.* 5ft. to 7ft. Austria, &c., 1817. Perennial. SYN. *E. exaltatus*. See Fig. 695.

E. exaltatus (lofty). A synonym of *E. commutatus*.

E. Ritro (Ritro).* *fl.* blue. Summer. *l.* pinnatifid, not spinescent, downy beneath, webbed above. *h.* 3ft. South Europe, 1570. Perennial. (B. M. 932.)

E. R. ruthenicus (Russian). *fl.-heads* blue. Summer. *l.* alternate, leathery, pinnatifid; divisions toothed and spiny; dull green above, cottony beneath. Stem downy. *h.* 3ft. to 4ft. Eastern Europe and Western Asia, 1816. Perennial.

FIG. 696. FLOWERING BRANCH OF ECHINOPS SPHÆROCEPHALUS.

E. sphærocephalus (globe-headed). *fl.-heads* pale blue. Summer. *l.* sinuate-pinnatifid, spinose, green and hairy above, white or grey-felted beneath. Stems erect, striated, branched. *h.* 1ft. to 4ft. Europe, Western Asia. See Fig. 696.

ECHINOPSIS (from *echinos*, hedgehog, and *opsis*, like; referring to the spines which clothe its globose stem). ORD. *Cacteæ*. A small genus of stove Cacti, now generally placed as a section of *Cereus*. Calyx tube elongate, downy; lobes numerous; stamens in two series; the exterior adnate to the calyx tube; inner free. Fruit

Echinopsis—*continued.*

scaly. Stem depressed, ribbed, globose, or cylindrical. There are about two dozen species in cultivation, many very rare, and of which the following selection will be found a representative one. For culture, *see* **Cactus.**

E. campylacantha (curved-spined). *fl.* about 6in. long, from the areolæ near the centre of the plant; calyx tube funnel-shaped, olive-green; segments of the limb gradually passing into the spreading, acute, pale rose-coloured petals. Plant about 1ft. high, between ovate and globose; areolæ approximate, large, oval, woolly, bearing from eight to ten rather slender spines. Andes, 1851. A handsome and well-marked species. (B. M. 4567.)

E. cristata (crested).* This plant closely corresponds with the variety described below, but has a larger and different-coloured flower; the petals are broader in proportion to their length, a creamy-white gradually passing into the greenish-purple of the outer sepals; the spines in the present form are more slender, less curved, of a paler colour, but tipped with a darker brown. It flowers in July. Bolivia, 1846. (B. M. 4687.)

E. c. purpurea (purple). *fl.* very large, two to four from a plant, arising from near the summit and from one of the pulvilli, funnel-shaped; tube 6in. long, green, bearing numerous acuminated scales, fringed with rather copious woolly black hair; uppermost scales longer, gradually passing into sepals; petals rose-coloured, numerous, oblong, spreading, serrated and mucronate at point. July. Plant globose, but depressed and rather deeply umbilicated at top, full green (not glaucous), somewhat glossy, deeply furrowed. Ribs about seventeen or eighteen, nearly straight, much compressed, notched at nearly equal intervals, and thus divided into a number of very obtuse rounded lobes. Pulvinuli in the notches, from which also rise ten to twelve strong, large, slightly-curved unequal spines, the uppermost one the longest and strongest. *h.* 1ft. Bolivia, 1844. A very handsome plant, remarkable for the large size of its flowers and for the deeply-lobed ribs of the stem. (B. M. 452.)

FIG. 697. ECHINOPSIS DECAISNEANUS.

E. Decaisneanus (Decaisne's). *fl.* white. Summer. Stem globular when young, sub-columnar when old, light glaucous green, with about fourteen compressed acute ribs; areolæ crowded, with white tomentum; spines short, greyish; interior ones very small. *h.* 6in. to 15in. Native country unknown. See Fig. 697.

E. Eyriesii (Eyries').* *fl.* large, in proportion to the size of the plant, deliciously fragrant, breaking forth from one of the angles, ascending; tube 9in. long, funnel-shaped, greyish-green, woolly, and marked with numerous tufts of oblong brown hairs; within green; petals numerous, lanceolate, very acuminate, white, patent, often reflexed; stamens numerous, rising a little above the tube of the flower, most numerous on one side; anthers yellow. January. Plant sub-globose, depressed, and even umbilicated at the top, about as large as a middling-sized orange, marked with several—twelve to fourteen—sharp and prominent angles, upon which are several white, rounded, woolly tubercles, mixed with several short, and not very conspicuous, spines. Mexico, 1835. (B. M. 3411, under name of *Echinocactus Eyriesii*.)

E. E. glaucus (glaucous). *fl.* sweet-scented. July. This plant is very similar to the type, from which it differs in having the angles much more acute and less wavy; the spines longer, more slender, and rather browner, and the tube of the flower is shorter, green, and free from the long, coarse, ash-coloured

Echinopsis—*continued.*

shagginess which distinguishes the original species. Native country unknown. (B. R. 1831, under name of *Echinocactus Eyriesii glaucus.*

E. formosa (beautiful). Stem sub-globular or elongated, pale green. Ribs obtuse, vertical, rounded, about sixteen in number; areolæ distant, oval, greyish, rather woolly; spines needle-like, rigid; two to four interior ones long, brown; eight to sixteen exterior fawn-coloured or whitish. *h.* 1ft. Mendoza.

FIG. 698. ECHINOPSIS PENTLANDI LONGISPINUS.

E. multiplex (multiplied).* *fl.* 6in. to 8in. long, and almost as much across when fully expanded; tube long, clavate, thickly clothed at the base with short tufts of dense white hairs, while the rest of the tube is beset with longer and dark-coloured ones; petals numerous; outer ones narrow-lanceolate, gradually

FIG. 699. ECHINOPSIS PENTLANDI SCHEERII.

Echinopsis—*continued.*

becoming shorter and broader, so that the innermost ones are almost ovate and acuminate, all of a delicate rose-colour, deeper towards the apex; anthers yellow, rounded. Plant marked with about thirteen deep furrows and as many ridges, which are prominent, acute, somewhat sinuated at the keel, and there beset with thickly downy oval areolæ; spines ten to twelve, the central one longer and stronger than the rest, especially in the upper areolæ, where they are represented of a uniform deep tawny colour, while those on the sides are more regular in size, and variegated with dark brown and white. *h.* 6in. South Brazil (according to Pfeiffer). A very desirable plant, on account of the delicacy and richness of colour of the petals. SYN. *Cereus multiplex.* (B. M. 3789.)

E. oxygonus (sharp-angled). *fl.* proceeding from the furrows about the foot of the stem, nearly 1ft. long, reversed cone-shaped; tube somewhat curved, externally covered with bracts; the lower are small red, increasing in size, and at last terminating in the petals, which are broad, lance-shaped, and of a rose-colour. Plant nearly of a globular form, of a bluish-green colour. Ribs fourteen, rising from a broad base, and running into an acute edge; the furrows are somewhat sharp spines, about fourteen, of various sizes, the outer generally larger, the inner smaller, all of a brown colour, cone-like, not flat, the younger surrounded by a tomentum which is more or less wanting in the older. Brazil. (B. R. 1711, under name of *Echinocactus oxygonus.*)

E. Pentlandi (Pentland's). *fl.* bright rose-carmine. Summer. Plant globular or sub-globular, with twelve or thirteen (rarely with a larger number) acute, spiral, notched ribs, rather glaucous-green; areolæ more or less crowded, woolly, furnished with generally nearly equal spines. Peru, 1843.

E. P. longispinus (long-spined). *fl.* crimson. Stem sub-globular; spines very long, dark brown. See Fig. 698.

E. P. Scheerii (Scheer's). *fl.*, petals yellow below, bright rose above. Stem nearly globular; spines long. See Fig. 699.

ECHINOSPERMUM (from *echinos*, a hedgehog, and *sperma*, a seed; referring to the prickly bur). SYNS. *Lappula* and *Rochelia.* ORD. *Borragineæ.* A genus containing about fifty species of annual, biennial, or perennial, hispid or pubescent herbs, very few of which are in cultivation. Flowers blue or whitish, usually small, racemose or spicate. Leaves alternate, often narrow. The species are most abundant in the temperate regions of the Northern hemisphere. For culture, *see* **Myosotis.**

E. diffusum (diffuse). *fl.*, corolla bright blue; racemes commonly loose and spreading. *fr.* a globose bur. *l.* oblong-lanceolate, or the lowest spathulate, narrowed at base into long wing-margined petioles; the upper sessile, from oblong-lanceolate to ovate or cordate, passing into small bracts. *h.* 1ft. California. Perennial. SYN. *E. nervosum.*

E. Lappula (Little Bur). This species has all the appearance and the small flowers of a Myosotis, but with very rough triangular nuts. South Europe. Annual. It has been occasionally found in isolated localities in England, where it, no doubt, was accidentally introduced.

E. marginatum macranthum (large-flowered, margined).* *fl.* pale blue, Myosotis-like; racemes many-flowered. *l.* lanceolate, rough. Stems erect. Russia. Biennial. (R. G. 1119.)

E. nervosum (nerved). A synonym of *E. diffusum.*

E. virginicum (Virginian). *fl.*, corolla slightly surpassing the calyx, pale blue or white. *fr.* globular, armed all over with short prickles. *l.*, radical ones round, ovate or cordate, slender, petioled; cauline ones ovate-oblong to oblong-lanceolate, acuminate at both ends; uppermost passing into lanceolate bracts. Stem 2ft. to 4ft. high, erect, with long and widely spreading branches. Canada to Louisiana. Annual. SYN. *Myosotis virginica.*

ECHINOSTACHYS. A synonym of **Pycnostachys** (which *see*).

ECHIOGLOSSUM STRIATUM. *See* **Cleisostoma striatum.**

ECHITES (from *echis*, a viper; referring probably either to its deleterious quality or its twining habit). ORD. *Apocynaceæ.* A genus of about thirty-five species of handsome stove evergreen twining shrubs, all natives of tropical America. Flowers sub-corymbose; corolla salver-shaped, having a naked throat and tube, with unequal segments; peduncles interpetiolar, many-flowered. Leaves opposite; interpetiolar cilia glandular. For culture, *see* **Dipladenia.**

E. atropurpurea (dark-purple).* *fl.* dark chocolate-colour. July. Brazil, 1814. (B. R. 1843, 27.)

Echites —*continued.*

E. franciscea (River Francisco). *fl.* purplish-red, large; peduncles short, producing from six to eight-flowered umbels. September. *l.* dark green. Brazil, 1845. (B. R. 1847, 24.)

E. f. sulphurea (sulphur).* *fl.* sulphur-coloured, with a red tube and a rose-coloured eye; smaller than in the type. Brazil. A pretty, distinct variety. It is a free-growing stove creeper, and may be cultivated either in a pot, and supported by neat rods or a wire trellis; or planted out in a border, against a back wall or pillar. (B. M. 4547.)

FIG. 700. ECHITES NUTANS.

E. nutans (nodding).* *fl.* yellow, nodding, in panicles, peduncular; corolla lobes blunt, wavy. September. *l.* ovate, acuminate, pale pea-green, the midrib and nerves veined with beautiful transparent red, downy beneath. West Indies, 1823. See Fig. 700. (B. M. 2473.)

E. rubro-venosa (red-veined). *l.* covered with a brilliant network, which is speckled with bright red or a golden-yellow, and stands out conspicuously from the emerald-green ground. South America, 1867. A very handsome plant. (F. d. S. 1728.)

E. scholaris. *See* **Alstonia scholaris.**

E. splendens (splendid). A synonym of *Dipladenia splendens.*

E. stellaris (starry).* *fl.* rose, yellow; racemes axillary, a little hispid, ten to twelve-flowered; peduncles downy. September. *l.* ovate-oblong, glabrous above, downy beneath. Branches downy. *h.* 6ft. Brazil, 1831. (B. R. 1664.)

E. umbellata (umbellate). *fl.*, corolla silky, villous inside the tube, large, with a white or pale yellow limb and green tube; umbels few-flowered. July. *l.* ovate-orbicular, cuspidately mucronate, 2½in. long. West Indies, &c., 1733.

ECHIUM (from *Echion*, the old Greek name given to this plant by Dioscorides). Viper's Bugloss. ORD. *Boragineæ.* A genus of about twenty species (chiefly South European and Oriental) of very handsome rough, shrubby or herbaceous, hardy or greenhouse plants. Flowers in spiked or panicled racemes, recurved at top. Leaves alternate. All the species of this large genus are of very easy culture in good ordinary garden soil. Cuttings of the shrubby sorts will root in sandy soil, under a hand glass, but they are more readily increased by layers. The herbaceous species are easily raised from seeds. The following are nearly all those which are in cultivation. About fifty forms have been described as species; a careful study of the genus would probably reduce the number to about half.

E. albicans (whitish). *fl.*, corolla at first rosy colour, ultimately becoming violet, nearly 1in. in length; racemes branching,

Echium—*continued.*

recurved at the ends. *l.* forming a dense tuft, linear-lanceolate, tapering at the base. *h.* 6in. to 18in. Spain. Plant clothed with hoary, appressed, bristly hairs. Hardy perennial. (G. C. n. s., xv. 301.)

E. candicans (whitish).* *fl.*, corolla blue, pilose at top outside; panicles terminal, conical; spikelets pedunculate, simple. May. *l.* lanceolate, clothed with silky, silvery, canescent down. Stem branched. *h.* 2ft. to 4ft. Madeira, 1777. Greenhouse biennial.

E. creticum (Cretan). *fl.*, corolla reddish-violet, irregular; spikelets simple, axillary, and terminal, many-flowered. July. *l.* oblong-lanceolate, hispid. Stem herbaceous, diffuse, very hispid, branched at the base. *h.* 6in. to 18in. South Europe, 1683. Hardy annual. (B. M. 1934.)

E. fastuosum (proud).* *fl.*, corolla deep blue, campanulate; panicle thyrsoid, ovate, large, dense; spikelets pedunculate, simple. April to August. *l.* oblong-lanceolate, acuminated, veiny, beset with soft white hairs, ciliated. Stem branched, rather villous above. *h.* 2ft. to 4ft. Canary Islands, 1779. Greenhouse evergreen. (R. H. 1876, 10.)

E. vulgare (common). *fl.*, corolla fine purple in bud, afterwards violet-blue, downy outside; racemes terminal, spike-formed, long; spikelets spreading, simple. Stem usually simple, tubercled. *h.* 2ft. to 4ft. Europe (Britain). Biennial. (Sy. En. B. 1095.)

ECLOPES. Included under **Relhania** (which *see*).

EDELWEISS. *See* **Leontopodium alpinum.**

EDENTATE. Without teeth.

EDGEWORTHIA (named in honour of M. P. Edgeworth, of the East India Co.'s service, and a botanist). ORD. *Thymelaceæ.* Ornamental greenhouse evergreen shrubs, closely allied to *Daphne.* The only other species besides that here described is a native of East Indies. They grow best in a compost of two parts sandy loam and one part turfy peat. Good drainage, and a liberal supply of water in summer, are essential in the culture of these plants. Increased by cuttings, inserted in sandy soil, under a bell glass, in spring.

E. chrysantha (golden). *fl.* yellow, capitate; tube of corolla clavate, clothed with silky hairs. February. *l.* oblong-lanceolate, stalked, dull green, pilose on the ribs beneath. *h.* 1ft. China and Japan, 1845. (B. R. 1847, 48.)

EDGING. This term is applied to dwarf plants, turf, or material of any description, used in gardens for dividing beds, borders, &c., from the walks. It also refers to an outside line of short plants in an arrangement with others of a taller-growing character. Turf verges are only to be recommended for flower gardens or pleasure grounds, where they should be wide enough to admit of mowing with the machine each time the lawns are cut. In a kitchen garden, they would necessitate too much work in keeping in order, as, besides mowing the verge, the Edge on each side of it would require to be frequently clipped. Box Edging is largely used for walks, and looks well if the whole length grows evenly. It has, however, the disadvantage of harbouring slugs, &c., and also of being liable to destruction in patches by severe frosts. Thick corrugated tiles, placed lengthways in a vertical position, or common bricks, used similarly, but set on an angle towards the walk, form a clean and permanent Edging, when properly laid, for kitchen gardens. These latter are also uninjured by salt or acids, used in many places for killing weeds in the gravel. In preparing the ground for an Edging of any description for walks, it should first be firmly and evenly trod its full length, and also well raked. The proper levels should be marked by short pegs, driven in the ground about 10ft. apart. If such pegs are placed straight, and a line tightly strained to touch their tops, the necessity of removing or adding soil in any part of it may be at once seen. It is impossible to cut out, plant, or fix an Edging properly if the ground is not previously carefully prepared.

EDGING-IRON. A crescent-shaped tool, made of steel, with a socket for the insertion of a straight wooden handle. It is most useful for cutting turf verges by the sides of walks, flower-beds, &c., as, being well under the guidance of the hand, it may be employed with equal facility either in a curved or straight line.

EDRAIANTHUS. *See* **Wahlenbergia.**

EDWARDSIA. *See* **Sophora.**

EFFUSE. Generally applied to an inflorescence. A very loosely-arranged panicle is said to be Effuse.

EGENOLFIA. *See* **Acrostichum.**

EGG-BEARING GOURD. *See* **Cucurbita Pepo ovifera** and **Vegetable Marrow.**

EGG PLANT. *See* **Aubergine.**

EGLANTINE. "A name that has been the subject of much discussion, both as to its exact meaning, and as to the shrub to which it belongs." The Eglantine of Gerard, Parkinson, and some of the other old writers, is, no doubt, *Rosa rubiginosa*, our common Sweetbriar. The "twisted Eglantine" of Milton is "supposed to have meant the Woodbine (*Lonicera Periclymenum*), which is still known as Eglantine in North-east Yorkshire" (Prior).

EGYPTIAN BEAN OF PYTHAGORAS. *See* **Nelumbium speciosum.**

EGYPTIAN LOTUS. *See* **Nymphæa Lotus.**

EHRETIA (named after G. D. Ehret, an artist and botanist, born in Germany 1708, died in England 1770). TRIBE *Ehretieæ* of ORD. *Borragineæ*. Handsome stove or greenhouse evergreen trees or shrubs. Flowers usually white, small, in corymbose cymes or terminal panicles; calyx small, deeply five-parted; corolla salver-shaped, with a five-parted limb. Leaves petiolate, alternate, opposite, or three in a whorl, entire or serrated. They thrive in a compost of loam and peat. Cuttings will root in sandy soil, in spring, if placed under a bell glass, in bottom heat.

E. serrata (serrate). *fl.* white, small, numerous, collected into small, nearly sessile fascicles, having a powerful honey-like perfume. *l.* alternate, broad-lanceolate, serrated, five-pointed. *h.* 6ft. East Indies, 1823. Stove. (B. R. 1097.)

E. tinifolia (Tinus-leaved). *fl.* white, small, numerous, strong-scented; panicles terminal, oblong. June, July. *l.* oblong-ovate, or ovate, quite entire, about 4in. long. *h.* 16ft. to 28ft. West Indies, &c., 1734. Greenhouse.

EHRETIEÆ. A tribe of the order *Borragineæ*.

EICHHORNIA (named in honour of J. A. F. Eichhorn, an eminent Prussian). ORD. *Pontederiaceæ*. Interesting and beautiful stove aquatics, natives of South America and tropical Africa. They may be placed in large pots, filled with rather coarse rich soil, which should afterwards be immersed and kept in a tank of water heated to about 80deg. *E. crassipes* floats on the surface of such water, and grows freely, without the roots being in soil. Propagated by division of the rhizomes, in spring.

E. azurea (blue).* *fl.* scattered or crowded in pairs along a stout, hairy, sessile rachis; perianth bright pale blue, funnel-shaped, hairy externally. July. *l.* on long or short petioles, which are not inflated; very variable in size and shape, 3in. to 8in. in diameter, from rounded-cordate to trapeziform or rhomboid, or very broadly oblate and obcordate, rounded-retuse or sub-acute at the tip. Stem as thick as the thumb, floating and rooting, green, smooth, flexuous. Brazil, 1879. (B. M. 6487.)

E. crassipes (thick-stalked).* *fl.* funnel-shaped, about 1½in. long, of six ovate-oblong violet segments; racemes many-flowered; flower-stalks thick; spathe terminal, recurved. Summer. *l.* large, fleshy, orbicular, acute-stalked; stalk much thickened at the base. Rhizome thick. 1879. (B. M. 2932, under name of *Pontederia azurea*.)

E. paniculata (paniculate). *fl.* in a compound spike of from ten to twelve; perianth petaloid, two-lipped; lower lip of three purple segments; upper and smaller of three blue ones, with a two-lobed white spot in the centre, yellowish in the disk. Summer. *l.*, radical ones on long petioles, all cordate and acuminate, entire, striated; the sinus at the base deep and narrow. Stems often several from the same root, 1ft. to 1½ft. high in the strongest specimens, erect, terete, soft and herbaceous, sheathed below with the membranaceous and stipulate bases of the radical leaves, and a few long leafless scales. South America. (B. M. 5020, under name of *E. tricolor*.)

EKEBERGIA (named in honour of Charles Gustavus Ekeberg, captain of a Swedish East Indiaman, who took Sparmann to China for the purpose of making inquiries in natural history). ORD. *Meliaceæ*. A genus of about three species of fine greenhouse evergreen trees, from tropical and Southern Africa. For culture, *see* **Melia.**

Ekebergia—*continued.*

E. capensis (Cape). *fl.* white. July. *l.* impari-pinnate, with four or five pairs of elliptical, acuminate, smooth leaflets. Cape of Good Hope, 1789. A large tree.

ELÆAGNACEÆ. A small order of trees or shrubs, more or less covered with minute silvery or brown scurfy scales. Flowers white or yellow, regular, one or two-sexual, axillary, fascicled or cymose. Leaves alternate or opposite, exstipulate, entire. The order is represented in Britain by *Hippophäe rhamnoides*, the Sea Buckthorn, a spiny shrub, thriving well near the sea. There are three genera, *Elæagnus*, *Hippophäe* and *Shepherdia*, and about twenty species.

ELÆAGNUS (from *Elaios*, the Olive; and *Agnos*, the *Vitex Agnus-castus*; the *Elæagnos* of Theophrastus is the Willow). Oleaster, or Wild Olive. ORD. *Elæagnaceæ*. Very ornamental, deciduous or evergreen shrubs or small trees. Flowers axillary, clustered or solitary; perianth campanulate or salver-shaped. Leaves simple, alternate. They grow freely in any ordinary soil that is tolerably dry, and may be readily increased by seeds, layers or cuttings.

E. argentea (silvery). *fl.* yellow, aggregate, nodding, axillary. July, August. *fr.* roundish-ovate, covered with silvery scales, ribbed. *l.* waved, oval-oblong, rather acute, glabrous on both surfaces, and covered with silvery scales. *h.* 8ft. to 12ft. North America, 1813. (W. D. B. ii. 161.)

E. crispa (curled). A synonym of *E. longipes*.

E. glabra (glabrous). *fl.* whitish, sub-solitary in the axils of the leaves. Autumn. *l.* ovate-oblong, acuminate, evergreen; adult ones green above, clothed below with rusty-coloured scales. *h.* 3ft. to 6ft. Japan. There are very pretty variegated forms of this species.

FIG. 701. FLOWERING BRANCH OF ELÆAGNUS HORTENSIS ANGUSTIFOLIA.

Elæagnus—*continued.*

E. hortensis (garden).* *fl.* yellow within, scaly without, solitary, or three or four together, fragrant. May. *l.* lanceolate, hoary all over with stellate hairs, 2in. to 3in. long. Branches brown and smooth, more or less spiny. *h.* 15ft. to 20ft. Orient, naturalised in South Europe, 1633. A handsome deciduous tree. (S. F. G. 152.)

E. h. angustifolia (narrow-leaved) only differs from the type in its narrower leaves. See Fig. 701. (B. R. 1156.)

E. longipes (long-stalked).* *fr.* orange, studded with small ferruginous scales, long-stalked, transparent, and produced in clusters. *l.* green above, silvery-white beneath. *h.* 3ft. Japan, 1873. A very desirable spreading evergreen shrub, with deep reddish-brown twigs. SYN. *E. crispa.* (G. C. 1873, 1014.)

E. macrophylla (large-leaved).* *fl.* greenish-yellow, clustered. Autumn. *l.* roundish-ovate, large, smooth, green above, covered below with bright silvery scales. *h.* 6ft. Japan. An unarmed bush.

E. pungens (stinging).* *fl.* yellowish, one or two together. *l.* oblong, entire, undulate, smooth, green above, silvery beneath. *h.* 6ft. Japan. A spiny shrub. There are very handsome variegated forms of this species.

ELÆIS (from *Elaia*, the Olive; oil expressed from the fruit as from olives). Oil Palm. ORD. *Palmæ.* A very small genus of stove palms. Fruit bright red, in large, somewhat obovate heads. Leaves pinnatisect, with strong prickly stalks. They form excellent decorative plants when in a young state, and thrive well in a rich sandy soil. Increased by seeds.

E. guineensis (Guinea). Stem erect, 20ft. to 30ft. high, terminated by a fine crown of pinnate dark green leaves, of about 15ft. in length. Guinea, 1730. This species yields the celebrated palm oil of commerce. (G. C. n. s., vii. 373.)

E. melanococa (black-seeded). This closely resembles the foregoing, but is smaller, with a somewhat decumbent habit, emitting roots from lower side of prostrate stem. Tropical America, 1821.

ELÆOCARPUS (from *Elaia*, an Olive, and *karpos*, a fruit; fruit round, containing a nut furnished with rugosities). Including *Monocera.* ORD. *Tiliaceæ.* Very handsome stove or greenhouse evergreen trees or shrubs. Flowers small, in racemes, usually fragrant; petals five, either toothed or beautifully fringed. Leaves alternate, or rarely opposite, entire or serrate. They thrive well in a mixture of loam and peat. Increased by cuttings, made of the ripened shoots, with leaves intact, and placed in a sandy soil, in bottom heat; or by seeds, sown in a hotbed.

E. cyaneus (blue). *fl.* white; racemes axillary, close-flowered. July. Drupe somewhat globose, blue. *l.* oblong-lanceolate, serrated, netted with veins. *h.* 15ft. Australia, 1803. Greenhouse. (B. M. 1737.)

E. grandiflora (large-flowered).* *fl.*, racemes few, two, four, or five-flowered, generally one or two among the terminal clusters of leaves, drooping; calyx of five narrow, almost linear-lanceolate sepals, quite red externally, white within; petals five, spreading, white or pale yellow, cuneate, more or less silky, especially externally; the apex laciniated; pedicels red, much longer than the petioles. Summer. *l.* from 3in. to nearly 6in. long, including the petiole, broad-lanceolate, tapering into a footstalk, a good deal clustered at the apices of the branches; apex generally obtuse; margin entire, or usually more or less crenato-serrated or sinuated. *h.* 7ft. Java, 1852. An extremely handsome stove plant. SYN. *Monocera grandiflora.* (B. M. 4680.)

E. serratus (serrate). *fl.* white, but purplish before opening, sweet-scented; racemes axillary or lateral, drooping. March to October. Drupe globose. *l.* with glands in the axils of the veins beneath, elliptic-oblong, serrated, acuminated. *h.* 50ft. East Indies, 1774. Stove.

ELÆODENDRON (from *Elaia*, an olive, and *dendron*, a tree; the fruit is like that of an Olive, and the seeds are oily). Olive-wood. Including *Portenschlagia.* ORD. *Celastrineæ.* This genus, which embraces about thirty species of ornamental stove or greenhouse trees or shrubs, is represented in all tropical countries; the majority, however, grow in Africa and India. Flowers small, in axillary fascicles. Leaves small, Laurel-like, opposite. For culture, *see* **Elæocarpus.**

E. capense (Cape).* *fl.* green, inconspicuous; corymbs axillary, dichotomous, a single flower standing in the fork, and the branches supporting three flowers each; bracts lanceolate, opposite, resembling much diminished leaves. *fr.* yellow, oval, about the size of a Hazel-nut, fleshy, and containing a hard nut with one to three cells. *l.* petiolate, sub-opposite, lanceolate-elliptical, the

Elæodendron—*continued.*

sides somewhat unequal, coriaceous, distantly spinuloso-serrulate, slightly revolute in the edges, dark green above, paler below, and often becoming rusty. Branches spreading, pendulous. *h.* 18ft. Cape of Good Hope, 1828. A handsome greenhouse decorative plant, when laden with its showy yellow fruits. (B. M. 3035.)

E. glaucum (milky-green). *fl.* greenish-yellow, small; panicles axillary; cymes loose, nearly the length of the leaves. *l.* acute, or acuminate, crenate or nearly entire, membranous or subcoriaceous. *h.* 6ft. India, &c., 1824. Stove evergreen.

E. xylocarpum (woody-fruited). *fl.* greenish-yellow; cymes dichotomous, one-half shorter than the leaves. *l.* obovate-oblong, entire or somewhat scalloped, glaucous, on very short petioles. *h.* 4ft. Island of St. Thomas, 1816. Stove evergreen.

ELAPHOGLOSSUM. Includer under *Acrostichum.*

ELATA. A synonym of **Phœnix.**

ELDER. The popular name of **Sambucus.**

ELECAMPANE. *See* **Inula Helenium.**

ELECTRA. A synonym of **Schismus.**

ELEMI. The name of certain stimulant gum resins, derived from various plants.

ELEPHANT APPLE. *See* **Feronia Elephantum.**

ELEPHANT'S FOOT. *See* **Testudinaria elephantipes.**

ELEPHANTUSIA. A synonym of **Phytelephas.**

ELETTARIA (Elettari is the native name of the plant in Malabar). ORD. *Scitamineæ.* A genus of stove plants, having much the appearance of *Amomum*, natives of the tropical parts of India. There are only two species, and, according to some authorities, these are but varieties of one. *E. Cardamomum* yields the Cardamoms of commerce. For culture, *see* **Maranta.**

E. Cardamomum (Cardamom). *fl.* pale greenish-white, alternate, short-stalked, in short racemes from the axils of the large bracts of the long-jointed flexuous flower-stems; calyx tubular, three-toothed, finely striated; corolla tube as long as the calyx; limb double, exterior portion of three oblong, concave, nearly equal divisions; inner lip obovate, longer than the exterior division, curled at the margins; apex three-lobed, marked in the centre with purple-violet stripes. *l.* lanceolate, acuminate, subsessile, entire, 1ft. to 2ft. long. Stem erect, jointed, enveloped in the sheaths of the leaves. *h.* 6ft. to 9ft. Hilly parts of Travancore and Malabar. (B. M. Pl. 267.)

ELEUSINE (mythological; from *Eleusis*, where was a celebrated temple of Ceres [Demeter]). ORD. *Gramineæ.* A genus of chiefly uninteresting grasses, all natives of the warmer parts of the globe. The culture is very simple, in the open air during summer, in a light soil. Propagated by seeds. *E. barcinonensis* has a fascicled spicate inflorescence, and *E. oligostachya* is pretty for winter bouquets.

ELICHRYSUM. *See* **Helichrysum.**

ELISENA (named in honour of Princess Elise, sister of Napoleon). ORD. *Amaryllideæ.* A small genus (three species are described, and these only appear to differ slightly from each other) of ornamental greenhouse bulbous plants. For culture, *see* **Hymenocallis.**

E. longipetala (long-petalled).* *fl.* white; divisions of the limb rotate, linear, 3in. long, the edge undulated, the point recurved; corona 1½in. deep; scape two-edged, about six-flowered. March. *h.* 3ft. Lima, 1837. (B. M. 3873.)

ELLEANTHUS (from *eilo*, I shut in, and *anthos*, a flower; in reference to the flower being closed by bracts). SYN. *Evelyna.* ORD. *Orchideæ.* A genus of pretty stove terrestrial orchids. About fifty species have been described, but few have been in cultivation. All are natives of tropical America. They are of easy culture in an ordinary orchid house, requiring a compost of loam and peat.

E. Caravata (Caravata). *fl.* bright yellow, with a short, purplish, inferior, twisted ovary; spike elongato-capitate, very compact, formed of numerous erecto-patent, purple, lanceolate-acuminate, imbricated, striated bracts, longer than the flowers; calyx of three ovato-lanceolate, suddenly acute, nearly erect sepals; petals shorter than the lip, as are the oblong, obtuse, nearly erect petals; lip large, erect, three-lobed. November. *l.* distant, on long, sheathing bases, lanceolate, rigid, very long, and gradually and finely acuminate. Stem about 1ft. high, erect, slender,

Elleanthus—*continued.*

terete, hispid, as is all the foliage, and, more or less, the bracts and sepals. Guiana, 1858. SYN. *Evelyna Caravata* (under which name it is figured in B. M. 5141).

E. kermesina (carmine). *fl.* bright carmine. January. *h.* 6in. Mariquita, 1843.

E. xanthocomus (yellow-haired). *fl.* yellow, in erect racemes. May. *l.* lanceolate, acuminate, vaginate. *h.* 1ft. Peru, 1872. Erect. (B. M. 6016.)

ELLIOTTIA (named in honour of Stephen Elliot, an American botanist, who died in 1830). SYN. *Tripetaleia.* ORD. *Ericaceæ.* A genus of three species of very pretty half-hardy evergreen shrubs, two of which are Japanese (these are probably not at present in cultivation), and the third North American. The one mentioned below does well in a warm situation, in a peaty soil. Propagated by cuttings.

E. racemosa (racemose). *fl.* white, in conspicuous terminal racemes or panicles, resembling those of *Andromeda.* August. *l.* alternate, entire. *h.* 4ft. to 10ft. Georgia.

FIG. 702. ELLIPTIC AND EMARGINATE LEAF.

ELLIPTIC. Formed like an ellipse; an oval figure. Fig. 702 shows an Elliptic and Emarginate Leaf.

ELLOBOCARPUS OLERACEUS. A synonym of **Ceratopteris thalictroides.**

ELM. *See* **Ulmus.**

ELODEA (from *elodes,* growing in watery places). Water Thyme. SYN. *Udora.* ORD. *Hydrocharideæ.* A genus of unattractive slender aquatic perennials. There are eight species, none of which are worth growing. *E. canadensis* merits mention in this work from the fact that its extremely rapid increase often entails no little work on the gardener. It was introduced from America to County Down about 1836, and into England in 1841. Very soon, it filled a number of canals and rivers with its dense, matted growths to such an extent as seriously to impede navigation. No inconvenience of this kind is complained of in its native country. In many places now (fish ponds, ornamental waters, &c.), where at one time it was so abundant, it seems to have almost disappeared, perhaps owing to the exhaustion in the soil of the specific nutriment on which the plant feeds.

ELONGATED. Lengthened out.

ELYMUS (from *elumos,* the old Greek name for a similar grass, used by Hippocrates). Bunch Grass. ORD. *Gramineæ.* A genus of about twenty species of tall perennial grasses, represented in Britain by the Lyme Grass, *E. arenarius,* a sea-side plant, useful for fixing, by means of its long creeping rhizomes, the moving sand. All are natives of North temperate regions. *E. condensatus* is described as a vigorous perennial grass, from British Columbia, forming a dense, compact, column-like growth, more than 8ft. in height, covered from the base almost to the top with long arching leaves, and crowned in the flowering season with numerous erect, rigid spikes, each 6½in. long, and resembling an elongated ear of Wheat in form.

EMARGINATE. Having a small notch at the end or tip, as if a piece had been taken out. See Fig. 702.

EMBELIA (Ceylonese name of one of the species). ORD. *Myrsineæ.* A genus of mostly stove climbing shrubs, or small trees. Flowers white or greenish-yellow, small, polygamous, mostly dicœcious. Fruit small, globose, one (rarely two) seeded. Leaves entire or toothed; petioles often margined or glandular. Embelias thrive in a compost of peat and loam. Propagated by cuttings, made of half-ripened shoots, and placed in sandy soil, under a bell glass, in heat. There are about sixty

Embelia—*continued.*

species; but *E. robusta* is probably the only one in cultivation.

E. robusta (robust). *l.* obovate-oblong, elliptic, or obovate, shortly acuminate, undulate or obscurely serrulate, rusty-pubescent, or rarely glabrous beneath, reticulated. Branches glabrous. *h.* 20ft. India. A large rambling shrub.

EMBOSSED. Projecting in the centre, like the boss, or umbo, of a round shield or target.

EMBOTHRIUM (from *en,* in, and *bothrion,* a little pit; referring to the pollen-cases, or anthers). ORD. *Proteaceæ.* A genus of four species of very ornamental evergreen shrubs. All are natives of the Andes, or extra-tropical South America. They require protection throughout the winter, in cold, northerly situations. In the southern counties of England, the one here described is quite hardy. For culture, *see* **Corethrostylis.**

E. coccineum (scarlet).* *fl.* orange-scarlet, long, pendent; perianth tubular, with a sub-globose four-cleft limb, bearing the sessile anthers on the concave lobes. Summer. *l.* simple, entire, oblong. *h.* 3ft. 1881. (B. M. 4856.)

EMBRACING. A leaf is said to Embrace a stem when it clasps the latter round with its base.

EMBRYO. The rudimentary plant within the seed.

EMERGENT. Protruded through the cortical layer.

EMERICIA. A synonym of **Vallaris.**

EMMENANTHE (from *emmenos,* enduring, and *anthos,* a flower; in reference to the persistent corolla). SYN. *Miltitzia.* ORD. *Hydrophyllaceæ.* A genus of dwarf annual herbs, containing five species, natives of North-west America. Flowers yellow; corolla campanulate, marcescent, persistent. Leaves alternate. None of the species are yet in general cultivation.

EMPETRACEÆ. A natural order of Heath-like evergreen shrubs. Flowers small, solitary or clustered, axillary or terminal, regular, polygamous, bracteolate or not. Fruit fleshy. Leaves alternate, exstipulate. The distribution of the order is North temperate and Arctic zones, Chili, and Fuegia. There are only four species. The order is represented in Britain by *Empetrum nigrum,* the fruit of which is eaten in some countries. The three genera are: *Ceratiola, Corema,* and *Empetrum.*

EMPETRUM (*Empetron,* the Greek name of a plant used by Dioscorides, from *en,* upon, and *petros,* a rock; in allusion to the place of growth). Crakeberry, or Crowberry. ORD. *Empetraceæ.* An ornamental hardy evergreen, low, spreading, Heath-like shrub. Flowers minute, axillary, dicœcious. Fruit a small berry-like drupe. Leaves small, crowded, entire, evergreen. They are well adapted for growing in damp, peaty situations. Propagated readily, in summer, by cuttings, which should be placed in sandy soil, under a handlight.

FIG. 703. FRUITING BRANCH OF EMPETRUM NIGRUM.

E. nigrum (black).* *fl.* sessile; sepals rounded, concave; petals pink, reflexed; filaments very long; anthers red. May. Berries brownish-black, globular, like those of the Juniper, edible. *l.* linear-oblong. *h.* 6in. to 12in. Distribution of the order. See Fig. 703. (Sy. En. B. 1251.)

E. n. rubrum (red).* *fl.* brownish-purple, axillary, solitary, sessile. May. Drupe red. *l.* linear-oblong, with woolly margins. *h.* 6in. to 12in. Chili and Fuegia, 1833. (B. R. 1783.)

EMPLEURUM (from *en,* in, and *pleuron,* the pleura or membrane which envelops the lungs;

Empleurum—*continued.*

seeds attached to a sort of coriaceous membrane). ORD. *Rutaceæ*. An ornamental greenhouse evergreen shrub. For cultivation, *see* **Diosma.**

E. serrulatum (serrulate). *fl.* small, axillary, solitary, or in pairs; peduncles short, bracteolate. June. *l.* alternate, linear-oblong, smooth, covered with glandular dots beneath. *h.* 2ft. to 3ft. Cape of Good Hope, 1774.

ENCEPHALARTOS (from *en*, within, *kephale*, the head, and *artos*, bread; the inner parts of the top of the trunk are farinaceous). ORD. *Cycadaceæ*. Very handsome greenhouse or conservatory plants, allied to *Cycas*; natives of tropical or Southern Africa. Leaves pinnate, thick, spiny, terminal. Trunk tall, cylindrical. Encephalartos thrive best in a strong loamy soil, with some river sand added. They are of very slow growth, unless kept in a high temperature. During the growing season, water should be copiously applied, both from water-pot and syringe; but when not making new growth, which sometimes is the case for several years, little water will be needed. Increased by seeds. Some of the species have been used most effectively in sub-tropical gardening, during the summer months.

FIG. 704. ENCEPHALARTOS ALTENSTEINII.

E. Altensteinii (Altenstein's).* *l.* pinnate, 2ft. to 6ft. in length; pinnæ oblong-acuminate, about 6in. long, 1in. broad, dark green above, paler below; apex and edges with long sharp spines; petioles much swollen at the base. Trunk stout. Cape of Good Hope, 1835. See Fig. 704. (G. C. n. s., vi. 392.)

E. A. Vromii (Vrom's). *l.* pinnate; pinnæ alternate below, opposite above, forty to fifty in number on each side of the rachis, oblong-lanceolate; apex spiny; margins with long spiny teeth; rachis marked with a prominent rounded ridge in the centre. South Africa, 1871.

E. brachyphyllus (short-leaved). *l.* pinnate, spreading; pinnæ erect, about 5in. long, ¼in. wide, stiff; apex spiny, bluish-green, paler beneath; petioles tomentose. Trunk stout. South Africa.

E. caffra (Caffrarian). Caffer Bread. *l.* pinnate, 3ft. to 4ft. long, spreading, recurved at the apex, with a very stiff texture; pinnæ linear-lanceolate, 4in. to 6in. long, 1in. broad, erectish; apex spinose. Trunk 8ft. to 18ft. high, 3ft. to 4ft. in circumference; crown scaly. South Africa. (B. M. 4903.)

E. Frederici-Guilielmi (Prince Frederick William's).* *l.* in a terminal crown, 28in. to 30in. long, oblong-obtuse, arching; pinnæ closely crowded, nearly opposite, those in the middle of the leaf 3in. long by ¼in. broad, linear-oblong. Trunk sub-

Encephalartos—*continued.*

globose, 4in. to 6in. in circumference, woolly-tomentose. South Africa, 1879.

E. Ghellinckii (Ghellinck's). *l.* pinnate, erect, spreading out from about the middle, 2ft. to 4ft. long; pinnæ linear-filiform, densely tomentose. Trunk stout, furnished with woolly scales. Plant spineless. South Africa, 1867. (I. H. 567.)

E. Hildebrandtii (Hildebrandt's). *l.* pinnate; pinnæ numerous, lower pairs diminishing into trifid scales ¼in. long, larger ones lanceolate, with distinct marginal and stronger and more crowded terminal teeth; petioles clothed at base with close cobwebby hairs. Trunk cylindrical. Zanzibar, 1877. (R. H. 1880, 456.)

E. horridus (horrid).* *l.* pinnate, 2ft. to 6ft. long, erect, abruptly reflexed at the top; pinnæ about 4in. long, with a long, sharp spine at the point. Trunk stout, short. Plant blue-green; texture harsh. South Africa, 1800. (G. C. 1865, 1131.) In the variety *trispinosus*, the inferior margin of the pinnæ is armed with three spines.

E. lanuginosus (woolly). *l.* pinnate, 3ft. to 6ft. long, erect, recurved towards the apex; pinnæ cordate-lanceolate, obtusely pointed, thick, 6in. long, 1½in. broad. Trunk 6ft. to 8ft. high, 3ft. in circumference. South Africa. Plant dark heavy green in colour, spineless.

E. Lehmanni (Lehmann's). *l.* pinnate, 6ft. long; pinnæ somewhat erect, 5in. to 7in. long, ½in. wide, with a short brown spine at the apex. Trunk 2ft. to 3ft. in circumference. South Africa. Plant very glaucous.

E. M'Kenii (M'Ken's). *l.* about 2ft. long, pinnate; pinnæ smooth, narrowly-lanceolate, somewhat distant, with a few teeth in their upper half, the shorter lower ones more strongly toothed, while below these are two rows of branched spine-like teeth extending down to the base; petiole woolly. South Africa, 1869.

E. plumosus (feathery).* *l.* large, pinnate; pinnæ armed with stout marginal spines. Trunk thick. South Africa, 1869.

E. Verschaffelti (Verschaffelt's). *l.* pinnate; pinnæ 3in. long, linear-lanceolate. South Africa, 1875. A stout and erect-growing species.

E. villosus (hairy).* *l.* pinnate, 3ft. to 6ft. in length, tapering at the base and apex; pinnæ very numerous, spiny-toothed, 6in. to 8in. long, 1in. broad, terminating in a sharp spine; petioles densely tomentose. Trunk short, thick, woolly-scaly. *h.* 6ft. Natal, 1866. (B. M. 6654.)

E. v. ampliatus (enlarged).* *l.* elegantly arching; pinnæ lanceolate, the teeth more numerous towards the tips; petiole thickly clothed at base with woolly hairs. Trunk cylindrical. 1874.

ENCHANTER'S NIGHTSHADE. *See* **Circæa.**

ENCYCLIA. A synonym of **Polystachya** (which *see*).

ENDERA. A synonym of **Taccarum** (which *see*).

ENDIVE (*Cichorium Endivia*). A hardy annual, which has been cultivated in this country since the early part of the sixteenth century, for the use of its leaves as a salad before the flower stems appear. It is hardier than the majority of Lettuces, and is in season more in the autumn and winter; its cultivation in early summer is not generally followed by good results, as the plants run so quickly to seed. Endive receives greater attention, and is cultivated more largely, on the Continent, especially in France, than in this country. It forms an important addition to salads; and, as it comes in use when few other salading vegetables are to be obtained, the cultivation should receive every attention, with a view to supplying well-blanched heads for use over as long a period in winter as possible. It is somewhat strange that many amateurs and cottagers, who consider their garden crops incomplete without a succession of Lettuces, should omit altogether the cultivation of Endive when the latter is just as easily grown, and may be sown or planted on land from which a previous crop has been taken. The means of blanching, and also of protecting, might be accomplished in various ways by those who took sufficient interest in doing it,

Endive—*continued.*

and the result would be an excellent supply of salad in many places where now the existence of the means of such supply is unknown.

Cultivation. Endive is seldom forced, and is unsuited for early summer cultivation. If, however, it is required, seed may be sown in a frame or a warm border, in April, and successional sowings made each time the previous one is well up. A first, of the Curled-leaved early sorts, should, in all cases, be made not later than the beginning or middle of July; another, of the Broad-leaved varieties, early in August; and a third in the middle or at the latter end of that month. In many gardens, Endive runs prematurely to seed when sown earlier than the dates mentioned; while in others, in cold districts, it would be advisable to precede them in each case, in order to have the plants fully grown before winter. The Curled varieties, being close-growing, more tender, and blanching quicker than those with broad leaves, should be selected for the first supply. The seed may be sown either thinly in beds, and transplanted when large enough; or in the open ground where the plants are intended to remain. A border with a south or a west aspect is best; and if a previous early crop, such as Potatoes or Peas, has been removed from the soil, it will generally be in good condition by merely levelling down. Drills, 1ft. or 1½ft. apart, may be drawn, and the seed inserted thinly, and covered with a rake. The young plants, when large enough to handle, should be thinned out to about 1ft. apart, and any blank spaces filled up. This system suits the early and main crops admirably; but those grown late for lifting are best transplanted when young, as this operation causes the production of more roots. A quick growth of the leaves should be encouraged by watering if the weather is dry, as this will also tend to prevent seeding. As soon as they are nearly full grown, blanching may be commenced, and this will be found practicable in many and various ways. Tying-up is sometimes sufficient; but, generally, inverted flower-pots, with the hole in the bottom stopped up; boards, placed at right angles over the rows, and covered with mats; frames with the glass darkened, or any other similar means, may be adopted with equally good results. The plants should, in no case, be covered except when quite dry. The blanching process takes from ten days to a fortnight, and, as Endive does not keep good for any length of time in this condition, a small quantity should be covered at frequent intervals. It is of little use unless thoroughly blanched. About the end of October, all full-sized plants should be lifted and stored close together in a frost-proof place, choosing a dry day for the operation. Any spare frames or pits may be utilised for the purpose; sheds will also be suitable for those intended to be used first, if the latter are covered and protected from frost. Where sufficient plants are grown, and means are at command for their preservation in winter, the season for Endive may be prolonged until the appearance of early Lettuces, in spring.

FIG. 705. CURLED-LEAVED ENDIVE.

Endive—*continued.*

Seed-saving. Only such plants as are true to the character of the variety should be kept for this purpose. Seed is best obtained from selected plants, which should be protected in winter by some means, and allowed to grow the following season. The flower-heads should be tied to stakes, and the seed gathered, dried, and stored, as it ripens. It will keep good for several years, and is preferred by some when rather old, as the plants are considered not liable to seed again so quickly as if it were newly-gathered.

Sorts. These may be separated into two classes: one, having narrow and much divided leaves, is called Curled Endives (see Fig. 705); the other, with larger leaves,

FIG. 706. BROAD-LEAVED ENDIVE.

not curled, being termed Broad-leaved Endives (see Fig. 706). Subjoined is a selection from the best in both classes.

BROAD-LEAVED BATAVIAN, a vigorous-growing variety, much cultivated, requires tying up; FRENCH SMALL GREEN CURLED, small, early, and very dwarf, blanches quickly; ITALIAN GREEN CURLED, dark green, narrow and much divided; LARGE GREEN CURLED, hardy, ties up well; MOSS CURLED, small, finely cut; PICPUS CURLED, a compact, close-hearted variety; SMALL BATAVIAN, broad leaves, the inner ones naturally forming a heart; STAG'S HORN, curled variety, hardy, much grown in France; WHITE BATAVIAN, broad-leaved, an excellent variety for blanching.

ENDIVE, WILD. *See* **Chicory.**

ENDOCARP. The inner membrane of a fruit; the lining of a carpel.

ENDOGENOUS. A stem is said to be Endogenous when it is formed by successive additions to its centre.

ENDOGENS. *See* **Monocotyledons.**

ENDOSPERM. The albumen of a seed.

ENGINES, GARDEN. These are of two descriptions, several forms of both being in use in gardens. One is termed a Hand Engine, from its being small and carried by the hand; the other is the Barrow Engine, so-called from being constructed on two wheels, and having a handle fixed to either side. Beyond throwing a continuous stream from the jet when in use, many of the former kind are not superior to a good syringe. A Barrow Engine is most useful for syringing trees or plants that require a force of water. Peach and other fruit-trees, either in houses or on walls outside, may be syringed frequently in the season of growth, excepting when in flower, and kept clean much more effectually by this than by any other method. This kind of Engine is also most useful for washing the glass inside of fruit and plant houses, at any time. The Barrow Engine is composed of an oval-shaped cistern, made preferably of wood, but sometimes of galvanised iron. It is invariably broader each way at the bottom than at the top. The lid is generally perforated, and either movable or fixed in two parts on hinges to the cross bridge that holds all the other parts in position. The working arrangements inside are very similar in principle to that of a force-pump, and consist of two upright cylinders, one con-

Engines, Garden—*continued.*

taining a piston and rod, and the other connected to this at the base for conducting the water, by means of a nozzle that turns round as desired, to any place within the reach of the force applied. The cylinder, with the piston inside, is connected with the water in the cistern, and has a valve at its base. On raising the piston by the handle attached to the rod at the top, the water passes into the cylinder, and the valve closes. By the next downward pressure, the water opens another valve and passes into the adjoining cylinder; and, as the latter valve will not allow it to return, and the outlet is frequently only a small hole, the water has to pass through in proportion to the size and the force applied. Many who have to use a Garden Engine almost daily in summer, have an insufficient knowledge of its construction and mode of working, and the result is that the leverage of the handle connected with the piston rod, and the great pressure of water consequently obtained, is unduly exercised, and the valves, or something else, soon become either out of order or broken. A perforated grating or rose should be placed at the base of the cylinder opening to receive the water, in order to prevent anything getting inside. Should an obstruction be caused, the use of the pump must be discontinued until the evil has been removed. These detailed remarks on the construction of the Garden Engine are given with a view to its being more generally understood and more carefully used.

ENKIANTHUS (from *enkuos*, enlarged, and *anthos*, a flower; flowers swollen). ORD. *Ericaceæ*. A genus of five species of elegant greenhouse or hardy evergreen or deciduous shrubs. Flowers white, scarlet, or rose, large, terminal, drooping; corolla campanulate, with a five-cleft limb. Leaves petiolate, coriaceous and persistent, or membranous and deciduous, entire or serrulate. They thrive well in a compost of loam and peat, in equal parts. Increased by cuttings, made of the ripe wood, and inserted under a bell glass, during the spring months, without heat. They should be potted carefully.

E. campanulatus (bell-shaped).* *fl.* greenish-white, tinted with red, in fascicled racemes, pendent; corolla cylindrico-campanulate. June. *l.* stalked, elliptic, argutely-serrulate, 2in. long. Japan. Hardy. SYN. *Andromeda campanulata.*

E. himalaicus (Himalayan). *fl.* in terminal umbels; corollas ½in. long, campanulate, five-lobed, five-angled, yellowish-red, with reddish streaks. June. *l.* ovate-lanceolate, acuminate. *h.* 20ft. Sikkim, 1879. Greenhouse. (B. M. 6460.)

E. japonicus (Japanese).* *fl.* white, globose, nodding. February. *l.* elliptic-obovate, membranous, dying off a brilliant golden-orange in autumn. Japan, 1870. A slender hardy deciduous shrub, with whorled branches. (B. M. 5822.)

E. quinqueflorus (five-flowered).* *fl.* red at the base, pale flesh-colour at the tips, large, drooping, five or six together at the tops of the branches. February to September. *l.* broad, opposite, oblong-elliptic, acuminated. Stem shrubby. *h.* 3ft. to 10ft. China, 1812. Greenhouse. SYN. *E. reticulatus.* (B. M. 1649.)

E. reticulatus (netted). A synonym of *E. quinqueflorus.*

ENSATE, or ENSIFORM. Quite straight, with the point acute, like the blade of a broad-sword, or the leaf of an Iris.

ENTADA (the Malabar name of one of the species). SYN. *Adenopodia.* ORD. *Leguminosæ.* A genus of stove climbing shrubs. Flowers white, sessile or shortly stalked, hermaphrodite or polygamous, disposed in dense spikes. Leaves bipinnate. Stems unarmed. There are about ten species, of which the one given below is the best. For culture, *see* **Mimosa.**

E. Pursætha (Pursætha). A synonym of *E. scandens.*

E. scandens (climbing). *fl.* about 1½in. long, in long slender spikes, either solitary or in the upper axils, or forming a terminal panicle; calyx very small, truncate, or minutely toothed; petals lanceolate, rigid, becoming at length quite separate. *l.* long-stalked; rachis usually ending in a tendril; pinnæ stalked, mostly four; leaflets oblong or obovate, 1in. to 2in. long, rigidly coriaceous. Legume woody, attaining 2ft. to 4ft. in length, and

Entada—*continued.*

3in. to 4in. in breadth. A woody climber. This is the common Sword Bean of the East and West Indies and tropical Pacific. SYNS. *E. Pursætha* and *Mimosa scandens.*

ENTELEA (from *enteles*, perfect; stamens all fertile). ORD. *Tiliaceæ.* An ornamental greenhouse or conservatory evergreen. It thrives well in a loamy soil, with which a little sand may be advantageously mixed. Increased by cuttings, inserted in sandy soil.

E. arborescens (tree-like). *fl.* white, in simple, lateral, or terminal erect stalked cymes; involucels of many short bracts. May. *l.* cordate, angular, doubly crenated, five-nerved, furnished with small permanent stipules, stellately downy. *h.* 20ft. New Zealand, 1820. (B. M. 2480.)

ENTIRE. Having no kind of marginal division.

ENTRANCES. The approach, or Entrance, to a mansion or any important glass structure in a garden, should at all times receive considerable attention when the designs are being prepared. In either case, it should be kept in good order, even more particularly than other parts of the garden or park. The position of a mansion and the neighbouring town or place from which the approach proceeds, must invariably form the main conditions in determining the line the latter is to take. In some cases, where the mansion is surrounded by trees, excepting a broad open view from the front, the Entrance is made at the side, and no sight of the building obtained until it is nearly reached. This applies mostly to those built on the side of a hill, or having massive trees as a background. Many others of noble proportions, built in a valley or on ground lower than that which surrounds it, have an Entrance through a broad avenue of trees planted at right angles to the front of the building, and reaching a considerable distance. Here a perspective view of the latter is obtained on first entering, that increases in magnitude until the end is reached. In either case, as many interesting views as possible of scenery, specimen trees, ornamental water, or other permanent subjects, should be introduced along the route. The Entrance being seen first and last by strange visitors to the mansion, should be made as attractive as possible, the impressions arising therefrom and afterwards communicated, tending greatly to enhance the pleasure and interest in the surroundings taken by the proprietor himself. Entrances to glass houses, such as conservatories, &c., should receive equal attention outside, in keeping clean and tidy, as that practised in the interior. Forecourts near the entrance to a mansion, if composed of gravel, should be frequently swept and rolled.

EOMECON (from *eos*, Eastern, and *Mekon*, a Poppy; so called because of its systematic position close to the Poppies, and its native country in Eastern Asia). ORD. *Papaveraceæ.* A monotypic genus. The species is a beautiful, half-hardy, perennial herb. It thrives in any fairly good soil, and may be increased by division.

E. chionantha (snowy-flowered). *fl.* terminal, 2in. in diameter, on slender pedicels; sepals combined into a boat-shaped spathe; petals pure white, nearly orbicular, concave, spreading; stamens yellow, numerous; scapes 1ft. or more high, reddish, subpaniculately branched above. Spring. *l.* radical, long-petiolate, 3in. to 6in. long, broadly cordiform, concave, the margins broadly sinuated; petioles 6in. to 8in. long. China, 1885. (B. M. 6871.)

EPACRIDEÆ. An order of corollifloral, dicotyledonous, shrubby plants, almost confined to Australia, New Zealand, and the Antarctic islands. Flowers axillary or terminal, either solitary and terminating peduncles more or less covered with imbricated, scale-like or leaf-like bracts, or in spikes or racemes; sepals usually finely marked with parallel or diverging veins; corolla white or of various shades of red, rarely blue, green, or yellowish. Leaves alternate, or very rarely opposite, often crowded or imbricate, rigid, entire or scarcely denticulate, with several longitudinal, simple or forked nerves, sometimes prominent underneath, sometimes very fine and numerous or very obscure. The order is divided into two sections,

Epacrideæ—*continued.*

Epacreæ and *Styphelieæ*. There are about twenty-six genera, and 320 species. Well-known genera are: *Dracophyllum*, *Epacris*, *Leucopogon*, and *Styphelia*.

EPACRIS (from *epi*, upon, and *akros*, the summit; in reference to the species growing, in their native habitats, on the tops of hills). ORD. *Epacrideæ*. A genus comprising twenty-six species of ornamental, much-branched, greenhouse shrubs, of which twenty-one are Australian, four are from new Zealand, and one from New Caledonia. Flowers axillary, usually disposed in leafy spikes; corolla tubular; calyx coloured, many-bracteate. Leaves scattered, petiolate or simple at the base. These are among the most useful of winter-flowering plants, either as decorative subjects or for cut flowers. They are, as a rule, more easily propagated and grown than Heaths, and the flowers last longer in a cut state. The young plants are obtained from cuttings in a similar way to Ericas; but, as the process takes a long time, it is advisable to purchase small plants from nurserymen who propagate in large quantities. The principal object should be to obtain strong shoots, if only a few, and get them thoroughly ripened in autumn, to flower the following winter and spring. The erect-growing varieties should be pruned hard back after flowering, about March, and kept rather close until new growth commences. When the shoots are about ½in. long, any repotting required should be at once seen to, using a compost of fibry peat, with the addition of one-sixth of silver sand. Efficient drainage must be secured, and the new soil made firm round the ball, which should not be broken, nor the roots disturbed by the process. Water should be withheld from the roots for a few days, light overhead syringings being sufficient. As the plants progress, more air and sun should be admitted, until about the end of July, when they may be plunged in ashes outside. Watering should be carefully performed at all times with Epacrises, as with all plants of a similar nature. A cool greenhouse, or other structure where frost is excluded, is a suitable position for them in winter. They will, however, bear with impunity more heat and moisture at this season than the majority of Ericas.

FIG. 707. FLOWERING BRANCH OF EPACRIS IMPRESSA.

A few of the varieties are of a natural pendent habit, and these do not require severe pruning like the others, but merely shortening back. The species of Epacris have produced a large quantity of beautiful garden forms that are, in most cases, superior to the types from which they originated. All are most beautiful and useful, and may be grown on for several years, if proper attention is bestowed.

E. acuminata (acuminate).* *fl.* few, nearly sessile in the uppermost axils; bracts and sepals rather broad, ciliate, acute, the sepals nearly one and a-quarter lines long; corolla tube about as long as the calyx; lobes obtuse, shorter than the tube. *l.* nearly sessile, ovate, acute or tapering to a pungent point, erect, concave, and clasping the stem at the base, spreading or recurved towards the end. *h.* 2ft. to 3ft. An erect, bushy shrub. SYN. *E. mucronulata.*

E. grandiflora (large-flowered). A synonym of *E. longiflora.*

E. impressa (flattened).* *fl.* varying from white to different shades of red, on very short peduncles; sepals more or less acuminate and ciliolate; bracts shorter and broader than the sepals; corolla tube varying from scarcely ¼in. to fully ½in. long,

Epacris—*continued.*

from almost campanulate to narrow-cylindrical, always with five impressed cavities outside, alternating with the stamens immediately above the ovary. March. *l.* sessile, from ovate-lanceolate to lanceolate-linear, tapering into a short and rigid or longer and pungent point, narrowed, rounded, or almost cordate at the base; midribs and often lateral nerves prominent underneath. *h.* 2ft. to 3ft. An erect, loosely-branched shrub, sometimes flowering when 6in. high. See Fig. 707. (B. M. 3407.) *E. campanulata* (L. B. C. 1925), *E. ceræflora* (B. M. 3243), *E. nivalis* (L. B. C. 1821), *E. ruscifolia*, and *E. variabilis* (L. B. C. 1816), represent forms of this species varying in colour of flower and size of leaves.

FIG. 708. FLOWERING BRANCH OF EPACRIS PURPURASCENS FLORE-PLENO.

E. longiflora (long-flowered).* *fl.* usually drooping, pedicellate; bracts acute, often decussate; sepals acutely acuminate, two lines long, or rather more; corolla tube cylindrical, often slightly curved, ¼in. to ⅜in. long, or even more in some specimens, crimson-red, except at the end, where it is white, as well as the lobes. May and June. *l.* shortly petiolate or almost sessile, ovate or ovate-lanceolate, tapering to a point, rounded or cordate at the base, many-nerved. Branches straggling, usually pubescent. *h.* 2ft. to 4ft. An erect shrub. SYNS. *E. grandiflora* (B. M. 982) and *E. miniata* (B. R. 1845, 5).

Epacris—*continued.*

E. miniata (vermilion). A synonym of *E. longiflora.*

E. mucronulata (mucronulate). A synonym of *E. acuminata.*

E. obtusifolia (obtuse-leaved). *fl.* white, axillary, usually forming long, one-sided, leafy racemes, either almost sessile or on peduncles of above one line; corolla sometimes almost campanulate; tube shortly exceeding the calyx; lobes broad. *l.* oblong-elliptical, obtuse, thick, few-nerved, slightly concave, narrowed into a short petiole. *h.* 1ft. to 3ft. An erect shrub. (L. B. C. 292.)

E. onosmæflora (Onosma-flowered). A synonym of *E. purpurascens.*

E. pulchella (pretty).* *fl.* pale red or pink, disposed along the branches on very short stalks; calyx segments equalling the tube of the corolla. May. *l.* rather concave, each ending in a spreading point, which is not so long as the base of the leaf. *h.* 1ft. to 3ft. 1804.

E. purpurascens (purplish).* *fl.* white, or more or less tinged with red; segments of calyx acuminated, about equal in length to the tube of the corolla. January to March. *l.* ovate-acuminate, ending each in a recurved mucrone, which exceeds the base of the leaf. *h.* 2ft. to 3ft. 1803. SYN. *E. onosmæflora.* (L. B. C. 237.) There is a pretty double-flowered form of this. See Fig. 708. (G. C. n. s., v. 340.)

E. rigida (rigid). *fl.*, corolla tube broad, as long as the calyx, with five transverse thickenings inside; sepals obtuse, or rarely one or two of them almost acute. *l.* almost sessile, erect or spreading, ovate or ovate-oblong, very obtuse and thick. *h.* 1ft. to 2ft. An erect, rigid, bushy shrub.

The following is a list of the best garden varieties:

ARDENTISSIMA, DENSIFLORA, DEVONIANA, ECLIPSE, EXONIENSIS, EXQUISITE, FIREBALL, HYACINTHIFLORA, H. ALBA, H. CANDIDISSIMA, H. CARMINATA, H. FULGENS, IGNEA, KINGHORNI, LADY ALICE PEEL, LADY PANMURE, LUCIFER, MINIATA SPLENDENS, M. GRANDIFLORA, MODEL, MONT BLANC, MRS. PYM, RAMOSA, RUBRA SUPERBA, SUNSET, THE BRIDE, VESTA, VESUVIUS, VISCOUNTESS HILL.

EPHEDRA (from *Ephedra*, the Greek name used by Pliny for the *Hippuris*, or Horse Tail, which it resembles). ORD. *Gnetaceæ.* Low-growing evergreen trailing shrubs. The species (about thirty have been described) are natives of South Europe, North Africa, temperate and sub-tropical Asia, and extra-tropical America. They have small scale-like leaves, and numerous slender-jointed green branches. These curious little plants are rarely grown, but *E. nebrodensis* is very showy when covered with its scarlet berries. They are very suitable for rockwork, and require little water. Increased by layering the young shoots or branches.

E. distachya (two-spiked). A synonym of *E. nebrodensis.*

E. monostachya (one-spiked). A synonym of *E. vulgaris.*

E. nebrodensis (Nebrodean).* *fl.* whitish; catkins twin; peduncles opposite. July, August. Berries red. *h.* 3ft. to 4ft. South-western Europe, 1750. An evergreen shrub, with numerous cylindrical wand-like branches, articulated, and furnished at each articulation with two small linear leaves. SYN. *E. distachya.*

E. vulgaris (common).* *fl.* whitish; catkins solitary; peduncles many. June, July. Berries red. *h.* 1ft. to 2ft. South Europe, 1772. An evergreen shrub, much smaller and hardier than *E. nebrodensis.* SYN. *E. monostachya.* (W. D. B. ii. 142.)

EPHEMERUM. A synonym of **Tradescantia.**

EPHIPPIUM. Included under **Cirrhopetalum.**

EPICARP. The outside covering of a fruit.

EPICARPURUS. A synonym of **Streblus.**

EPIDENDRUM (from *epi*, upon, and *dendron*, a tree; epiphytal on trees). Including *Physinga.* ORD. *Orchideæ.* A large genus (about 300 species) of stove and greenhouse Orchids, comparatively few of which are worth cultivating, the great majority having small, dingy-coloured flowers. Dr. Lindley says the essential character of the genus resides in the lip being more or less united by a fleshy base to the edge of a column, which is hornless, and considerably elongated, but not petaloid, and winged; in the pollen masses being four, equal and compressed; and, in the presence of a passage, more or less deep, at the base of the lip. Most of the species are epiphytes, though some few succeed in pots, under the same treatment as recommended for **Cattleya** (which *see*), except that less heat is needed. Growers of orchids, according to Mr. Williams, have been more deceived in buying Epidendrums than in any other group

Epidendrum—*continued.*

of similar plants. The bulbs of many kinds are so nearly alike that it is very difficult to tell what they are before flowering. Sometimes they have to be grown several years before this occurs; and then frequently only dingy green flowers are produced, about the same colour as the leaves. Some of these insignificant flowers are, however, very fragrant, and will perfume the whole house in which they are grown. In the following enumeration, the most beautiful and approved sorts only are included.

E. alatum majus (large-winged).* *fl.* pale yellow, disposed in straggling panicles, and remaining nearly six weeks in beauty; lip striped with purple. June, July. Guatemala. Greenhouse. SYN. *E. calochilum.* (B. M. 3898.)

E. aloifolium (Aloe-leaved). A synonym of *E. falcatum.*

E. atropurpureum (dark-purple).* *fl.*, sepals and petals dark rose or purple, the apices greenish, incurved; lip rose-coloured, with a dark blotch of crimson-purple in its centre. May, June. *h.* 6in. to 12in. Mexico, 1836. This species succeeds well either in a shallow pan or on a block, with sphagnum. Greenhouse. SYN. *E. macrochilum* (B. M. 3534). The variety *roseum* (F. d. S. 372) has the lip wholly of a dark rose colour.

E. aurantiacum (golden).* *fl.* bright orange, produced from a sheath at the top of the bulb, five to ten in a cluster; lip orange, striped with crimson. March to May. *h.* 1ft. Guatemala, 1836. A very handsome stove species. In habit and structure, it approaches *Cattleya Skinneri.* (R. G. 138.)

E. bicameratum (two-arched). *fl.* ochre-coloured, with a deep brown disk; lip white, ochre-coloured at the base. Mexico, 1871. Greenhouse.

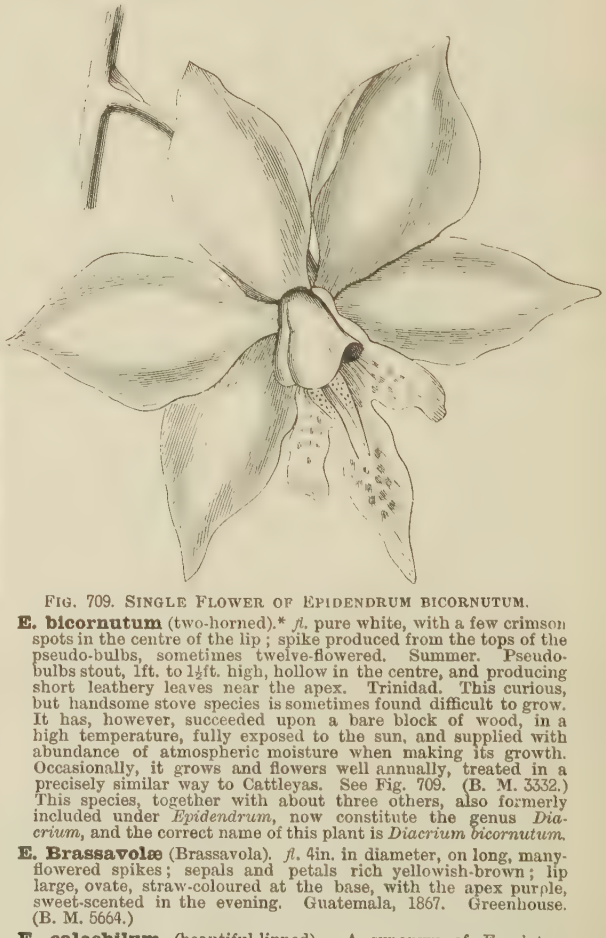


FIG. 709. SINGLE FLOWER OF EPIDENDRUM BICORNUTUM.

E. bicornutum (two-horned).* *fl.* pure white, with a few crimson spots in the centre of the lip; spike produced from the tops of the pseudo-bulbs, sometimes twelve-flowered. Summer. Pseudo-bulbs stout, 1ft. to 1½ft. high, hollow in the centre, and producing short leathery leaves near the apex. Trinidad. This curious, but handsome stove species is sometimes found difficult to grow. It has, however, succeeded upon a bare block of wood, in a high temperature, fully exposed to the sun, and supplied with abundance of atmospheric moisture when making its growth. Occasionally, it grows and flowers well annually, treated in a precisely similar way to Cattleyas. See Fig. 709. (B. M. 3332.) This species, together with about three others, also formerly included under *Epidendrum*, now constitute the genus *Diacrium*, and the correct name of this plant is *Diacrium bicornutum.*

E. Brassavolæ (Brassavola). *fl.* 4in. in diameter, on long, many-flowered spikes; sepals and petals rich yellowish-brown; lip large, ovate, straw-coloured at the base, with the apex purple, sweet-scented in the evening. Guatemala, 1867. Greenhouse. (B. M. 5664.)

E. calochilum (beautiful-lipped). A synonym of *E. alatum majus.*

E. Catillus (Catillus). *fl.* cinnabar-red, in clusters. Columbia, 1873. Greenhouse. (I. H. n. s. 162.)

Epidendrum—*continued.*

E. cinnabarinum (cinnabar-red). *fl.* orange-red, crowded at the top of a slender scape, 2in. across. May to July. *h.* 4ft. Brazil, 1837. Stove. (B. R. 1842, 25.)

E. cnemidophorum (sheathed).* *fl.* light yellow, spotted brown inside, pure white at back; lip white, shaded rose, deeply divided; spike terminal, about 1ft. long. *l.* about 8in. long, glossy, acuminated. *h.* 4ft. to 6ft. Guatemala, 1867. A stately greenhouse plant, with ample drooping racemes. (B. M. 5656.)

E. Cooperianum (Cooper's). *fl.* brownish-yellow; lip broad, rosy-purple; racemes terminal, drooping. *l.* lanceolate, acute. *h.* 2ft. to 3ft. Brazil, 1857. Stove. (B. M. 5654.)

E. crassifolium (thick-leaved). A synonym of *E. ellipticum.*

E. criniferum (hairy-lipped). *fl.* yellowish-green, with cinnamon blotches and bars; lip white, hairy. Costa Rica, 1871. Greenhouse. (B. M. 6094.)

E. dichromum (two-coloured).* *fl.* light rose-coloured, about 2in. in diameter, produced in large panicles, 2ft. to 3ft. high; lip three-lobed, rich crimson; pseudo-bulbs short and stout, supporting two or three dark green leathery leaves, from 6in. to 12in. or more in length. Pernambuco, 1865. Greenhouse. The variety *striatum* is a very handsome one, having sepals and petals white, with radiating deep purple lines.

E. eburneum (ivory). *fl.*, sepals and petals yellowish-green; lip very large, ivory-white, with yellow callosities; raceme terminal, four to six-flowered. *l.* alternate, large, deep green. *h.* 2ft. Panama, 1867. Greenhouse. (B. M. 5643.)

E. ellipticum (elliptic). *fl.* rose-coloured. March to June. *h.* 2ft. to 3ft. Brazil. Greenhouse. SYN. *E. crassifolium.* (B. M. 3543.)

E. erubescens (blushing). *fl.* produced in large panicles; sepals and petals of a delicate mauve colour, broad; lip rather darker, yellow at the base. Mexico, 1837. This very desirable greenhouse species is somewhat difficult to grow; but it has been found to thrive well on long blocks of wood, in a cool house.

E. evectum (extended).* *fl.*, racemes loose, sub-cylindric, many-flowered; perianth bright rose-purple; sepals and petals similar, narrow-obovate, obtuse; lip adnate to the column, rather longer than the sepals, three-lobed nearly to the base; lobes all deeply cut and fringed. *l.* sessile, oblong-lanceolate, obtuse, emarginate, coriaceous, plane; sheaths rather short. Native country unknown, but probably from New Grenada. A very handsome greenhouse species. (B. M. 5902.)

E. falcatum (falcate).* *fl.* fragrant, one or two together; sepals and petals greenish-yellow; lip brighter yellow, not fringed. Summer. Mexico, 1835. Stove. This plant remains in full beauty for a considerable time. SYNS. *E. aloifolium* and *E. Parkinsonianum.* (B. M. 3778.)

E. Frederici Guilielmi (Prince Frederick William's). *fl.* produced in large terminal panicles; sepals and petals dark purple, about 1in. long, lanceolate; lip trilobed; apex of the column and the disk pure white. *l.* distichous, 6in. to 8in. long, 1in. to 2in. broad, dark green. Peru, 1871. Stove. (I. H. n. s. 48.)

E. Grahami (Graham's). A synonym of *E. phœniceum.*

E. Hanburii (Hanbury's). *fl.*, sepals and petals deep, dull purple; lip rose, veined with crimson. Spring. *h.* 2ft. Mexico, 1843. Greenhouse. (R. G. 398.)

FIG. 710. SINGLE FLOWER OF EPIDENDRUM LINDLEYANUM.

E. Lindleyanum (Lindley's).* The correct name of the plant described in this work under its generally-recognised name of *Barkeria Lindleyana.* Stove. See Fig. 710.

Epidendrum—*continued.*

E. macrochilum (large-lipped). A synonym of *E. atropurpureum.*

E. myrianthum (many-flowered). *fl.* bright rosy-purple, small, in enormous panicles. Autumn. *l.* distichous, linear-oblong or lanceolate. Stems 3ft. to 4ft. high. Guatemala, 1866. This rare, free-flowering species grows best in a cool house. (B. M. 5556.)

E. nemorale (wood).* *fl.* about 3in. across, freely produced on large drooping panicles; sepals and petals of a delicate mauve or rosy-lilac, lanceolate; lip striped with violet. July. Pseudo-bulbs from 3in. to 5in. high, two-leaved. Mexico, 1840. This is a splendid stove species, but somewhat difficult to manage successfully, the fault, in most instances, being in keeping too much soil about its roots, and in not exposing it to the full sun. (B. M. 4606, under name of *E. verrucosum.*)

E. n. majus (larger). *fl.* produced in panicles, sometimes 3ft. in length; sepals and petals delicate rosy-mauve; lip white in the centre, with three short red lines, bordered deep rose. Stove.

E. paniculatum (panicled).* *fl.* purple or lilac-purple, with some yellow at the tip of the column, very numerous, disposed in a large terminal branched drooping panicle, upwards of 1ft. long. *l.* distichous, lanceolate-acuminate. Stems tall, reedy, 2ft. to 4ft. high. New Grenada, 1868. Greenhouse. One of the finest of the paniculate Epidendrums, and perhaps the most free-flowering of all orchids. (B. M. 5731.)

E. Parkinsonianum (Parkinson's). A synonym of *E. falcatum.*

E. phœniceum (purple). *fl.*, sepals and petals deep purple, mottled with green; lip clear bright violet, veined and stained with crimson. Summer. *h.* 6in. to 12in. Cuba, 1840. A handsome, large-flowered stove species, with branching panicles, 2ft. to 3ft. high. SYN. *E. Grahami.* (B. M. 3305.)

FIG. 711. SINGLE FLOWER OF EPIDENDRUM PRISMATOCARPUM.

E. prismatocarpum (prism-fruited).* *fl.* fragrant, ten to twelve on each erect raceme; sepals and petals yellow-green, spotted with dark purple or black; lip lilac-purple, bordered with white. June. Pseudo-bulbs flask-shaped, 10in. to 12in. in height, and, together with the evergreen leaves, dark green. Central America, 1862. Greenhouse. See Fig. 711. (B. M. 5336.)

E. pseudepidendrum (false Epidendrum). *fl.*, raceme terminal, few-flowered; perianth bright green, except the lip and upper part of the column, which are orange-vermilion; lip (free portion) sub-orbicular, retuse or emarginate from the end being recurved; margin erose and obscurely lobed. July. *l.* confined to the top of the stems, distichous, sub-erect, narrowly linear-oblong, acuminate, coriaceous, obscurely nerved at the back, deep green; back keeled; margins recurved. Central America, 1871. An extremely curious greenhouse species. (B. M. 5929.)

E. radicans (rooting). *fl.* dark orange-red, remaining in beauty for a considerable period, produced in long, terminal racemes. Guatemala, 1836. A pretty scandent greenhouse species, sometimes reaching 10ft. in height, and requiring the support of a stake. SYN. *E. rhizophorum.* (P. M. B. xii. 145.)

E. raniferum (frog-bearing). *fl.* yellowish-green, thickly studded with purple-brown spots, about 2in. in diameter, numerously disposed in pendulous racemes. *l.* oblong, acute. Mexico, 1839. Greenhouse. One of the most attractive species of the genus. (F. M. n. s. 445.)

E. rhizophorum (rooting). A synonym of *E. radicans.*

E. Sophronitis (Sophronitis-like). *fl.* dull yellow-green, mottled with dull violet-purple. May and June. *l.* two or three at the tip of the pseudo-bulb, 2in. to 3in. long, spreading, oblong-lanceolate, acute, thickly coriaceous, keeled, clothed on both surfaces with a pale glaucous-green, waxy secretion; margins purple. Pseudo-bulbs ovoid, green. Peru, 1867. Greenhouse. This is one of the most singular species of the genus. (B. M. 6314.)

E. Stamfordianum (Stamford's). *fl.* bright yellow and green thickly spotted with crimson, numerously produced on a branching spike. April, May. Guatemala, 1836. Greenhouse. (B. M. 4759.)

Epidendrum—*continued.*

E. syringothyrsis (Lilac-like).* *fl.* dark purple, with a little orange and yellow on the lip and column, in branching panicles, seventy to eighty-flowered. *l.* distichous, about 6in. long, light green. Stems slender, about 3ft. high. Bolivia, 1866. Stove. The specific name is derived from its resemblance to the Lilac in form and colour. (B. M. 6145.)

E. vitellinum (yolk-of-egg-coloured). *fl.* bright orange-scarlet, about 2in. in diameter; lip bright yellow; spike erect, ten to fifteen-flowered. Summer. *l.* and pseudo-bulbs glaucous. Mexico, 1840. It thrives best in a warm temperature and damp atmosphere. (B. M. 4107.) The variety *majus* is a handsome form, with considerably larger flowers, and broader sepals and petals, than the type.

EPIDERMIS. The transparent colourless membrane which covers almost all parts of plants exposed to the outward air, and is composed of one or more layers of firmly coherent, usually empty, cells.

EPIGÆA (from *epi*, upon, and *gaia*, the earth; in reference to its trailing growth). ORD. *Ericaceæ*. A genus of a couple of species of very elegant creeping, tufted, hardy evergreen shrubs. *E. repens* thrives only in peat soil and in shady situations. Increased by careful divisions of well-established tufts. The second species, *E. asiatica*, a Japanese plant, is not yet in cultivation.

E. repens (creeping).* Ground Laurel; in New England, called Mayflower. *fl.* white, tinged with red, in dense axillary and terminal racemes, exhaling a rich spicy fragrance. May. *l.* cordate-ovate, entire. Branches, petioles, and nerves of leaves very hairy. Northern United States, 1736. (G. W. F. A. 37.)

EPIGYNIUM. Included under **Vaccinium** (which *see*).

EPIGYNOUS. Growing upon the ovary. A term applied when the outer whorls of the flower adhere to the ovary.

FIG. 712. UPPER PORTION OF STEM OF EPILOBIUM ANGUSTIFOLIUM.

EPILOBIUM (from *epi*, upon, and *lobos*, a pod; flower seated as if it were upon the top of the pod). Willow-herb. ORD. *Onagrarieæ*. A genus of fifty species of hardy perennial herbs or sub-shrubs, occurring in all cold and temperate climates. Most of the species are of botanical interest only, but some are highly ornamental. Flowers axillary, solitary, or disposed in terminal spikes, each flower furnished with a bract. Leaves opposite, or irregularly scattered. They are of the easiest possible culture, in ordinary garden soil. Increased by divisions or seeds. As border plants, and for naturalisation in shrubberies and by watercourses, *E. angustifolium* and *E. hirsutum* are eminently well suited.

E. angustifolium (narrow-leaved).* French Willow, or Rose-bay. *fl.* crimson, disposed in spicate racemes, bracteate. July. *l.* nearly sessile, lanceolate, undulated. Stems erect, nearly simple. *h.* 3ft. to 6ft. Northern hemisphere (Britain). A very handsome species, but, from the rapidity with which it spreads, it should be wholly confined to shrubberies. See Fig. 712. (Sy. En. B. iii. 495.)

E. angustissimum (very narrow-leaved). A synonym of *E. rosmarinifolium*.

E. denticulatum (denticulate). *fl.* rose-coloured. Summer. *l.* somewhat lanceolate, denticulated; lower ones opposite. Stems suffruticose. *h.* 6in. to 12in. Peru.

E. Dodonæi (Dodoens').* *fl.* deep rose, large; pedicels connected with the bracts, crowded near the tops of the branches. July. *l.* linear, obsoletely denticulated. Stems erect, branched at the apex. *h.* 1ft. Europe, 1800. SYN. *E. Halleri*.

E. Halleri (Haller's). A synonym of *E. Dodonæi*.

FIG. 713. UPPER PORTION OF STEM OF EPILOBIUM HIRSUTUM.

E. hirsutum (hairy).* Codlins and Cream. *fl.* usually pale pink, sometimes white, large, disposed in a leafy, corymbose cluster. July. *l.*, lower ones opposite; upper ones alternate, ovate-lanceolate, hairy, toothed, half stem-clasping. *h.* 3ft. to 5ft. Europe (Britain), &c. The whole plant is downy, soft, and clammy, exhaling a peculiar acidulous scent. See Fig. 713. (Sy. En. B. 497.)

E. obcordatum (obcordate).* *fl.* bright rose-purple, large. Summer. *l.* opposite, ovate, sessile, numerous, mostly longer than the internodes (four to eight lines long), glaucous, opaque. Sierra Nevada, &c., California. A very charming low-growing alpine species, requiring a moist, well-drained spot in rockery.

E. rosmarinifolium (Rosemary-leaved).* *fl.* red; pedicels connected with the bracts, crowded near the tops of the branches. July. *l.* linear, obsoletely denticulated. Stems erect, branched towards the middle. *h.* 2ft. Europe, &c., 1775. SYN. *E. angustissimum*. (Sy. En. B. 494.)

EPIMEDIUM (from *epi*, upon, akin to, and *Medion*, a plant, said to grow in Media; a name from Dioscorides, retained by Linnæus). Barrenwort. ORD. *Berberideæ*. Ornamental hardy herbaceous perennials, with creeping perennial trunks, and annual stems. Flowers various-coloured. Leaves stalked, compound; leaflets awnedly-serrated. They form admirable plants for rockwork, and will thrive in a compost of fresh loam and peat, in equal proportions. Propagated by divisions of the root, which should be made during July or August.

FIG. 714. EPIMEDIUM ALPINUM.

E. alpinum (alpine).* *fl.* twelve to twenty in a lax panicle; outer sepals greyish; inner ones dark crimson; petals yellow, composed almost entirely of a slipper-shaped spur. *l.* biternate; leaflets cordate-ovate, acuminated, serrated. *h.* 6in. to 9in. Central Europe (naturalised here and there in Britain). See Fig. 714. (Sy. En. B. 52.)

E. a. rubrum (red). A synonym of *E. rubrum*.

E. diphyllum (twin-leaved). *fl.* white, numerous, small; peduncles bearing four to six drooping flowers in a simple, very lax raceme; petals not spurred. April and May. *l.*, petiole 2in. to 3in. long, bearing two (only) cordate-ovate leaves. Japan, 1830. The dwarfest species of the genus. SYN. *Aceranthus diphyllus*. (B. M. 3446.)

E. macranthum (large-flowered).* *fl.* white; raceme short, close, six to ten-flowered; spur of petals deflexed, ¼in. long. Early spring and summer. *l.* about 1ft. in length, biternate; leaflets nine, cordate-ovate, 2in. to 3in. long, closely ciliate-dentate. *h.* 10in. to 15in. Japan, 1836. This fine species is the handsomest of the genus. (B. R. 1906). *E. violaceum* (B. M. 3751) is a variety of the foregoing, from which it differs in being dwarfer in habit, and in having smaller violet-coloured flowers. There are several other garden forms, more or less distinct.

E. Musschianum (Mussche's).* *fl.* dull white; peduncles few-flowered; racemes simple, close, short. May. *l.* biternate, about 6in. long; leaflets nine, cordate-ovate, 2in. to 3in. long. Japan, 1836. (B. M. 3745.)

E. Perralderianum (Perraudière's). *fl.*, when expanded, bright yellow, ¼in. to ⅜in. in diameter; raceme simple, lax, about as long as the peduncle, twelve to twenty-flowered; outer sepals minute, oblong, deciduous; inner sepals orbicular, much imbricated, and spreading horizontally when fully expanded; petals with a bright yellow, toothed, erect lamina, and an incurved ligulate brown spur, nearly as long as the lamina. *l.*, leaflets usually three, cordate-ovate, 2in. to 3in. long, bright green or tinted with red-brown. Algeria, 1867. This species is closely allied to *E. pinnatum*. (B. M. 6609.)

E. pinnatum (pinnate).* *fl.* bright yellow; raceme lax, simple, 6in. long, twelve to twenty-flowered; peduncles about 6in. in length. Summer. *l.* radical, 1ft. to 1½ft. long, tripinnate; leaflets stalked, ovate-acute, serrated. *h.* 8in. to 2ft. Persia, 1849. A handsome strong-growing species. See Fig. 715. (B. M. 4456.)

FIG. 715. EPIMEDIUM PINNATUM, showing Habit and detached Flower.

E. rubrum (red).* *fl.* when fully expanded, ⅜in. to ½in. in diameter, in a lax panicle, springing from the side of the common petiole, 1in. or 2in. below its apex; outer sepals greyish, oblong, soon deciduous; inner sepals bright crimson, oblong-lanceolate, very convex on the back, spreading horizontally when the flower is fully expanded; petals pale yellow or tinted with red, with a small but distinct erect limb. *l.* varying from biternate to almost triternate; leaflets sometimes as many as twenty. Native country doubtful. 1854. This species entirely resembles *E. alpinum* in habit, but is more robust. SYN. *E. alpinum rubrum*. (B. M. 5671.)

EPIPACTIS (*Epipaktis*, a plant of Dioscorides; from *epipegnuo*, to coagulate; referring to its effect on milk). Helleborine. ORD. *Orchideæ*. A genus of eight species of very pretty hardy Orchids, natives of Europe and Russian Asia, except the extreme north. Flowers purple, brown, or white, rarely tinged with red, in a loose raceme; perianth spreading; petals shorter than the sepals, but otherwise similar; lip free from the column, thick and concave at the base, the terminal portion broad and petal-like, with two protuberances at the base. Stem leafy. They are of easy culture in shady woods, in friable loam mixed with chalk, and form excellent subjects for naturalising in artificial bogs, or in moist peaty spots. Increased by divisions. The two following species represent the genus in Britain.

E. latifolia (broad-leaved). *fl.*, greenish purple, drooping; spike long, loose; lower bracts longer than the flowers. Late summer. *l.* orbicular, ovate or oblong, embracing the stem. Stem from 1ft. to 2ft. high. (Sy. En. B. 1480.)

E. palustris (marsh). *fl.* whitish, tinged with crimson, slightly drooping, few, forming a loose ovate spike. July. *l.* lanceolate, embracing the stem. Stem about 1ft. high. (Sy. En. B. 1482.)

EPIPETALOUS. Growing on petals.

EPIPHLŒUM. The layer of bark immediately below the epidermis.

EPIPHORA. A synonym of **Polystachya** (which *see*).

EPIPHYLLOUS. Growing upon a leaf.

EPIPHYLLUM (from *epi*, upon, and *phyllon*, a leaf; the flowers arise from the flat branches, which appear like leaves). ORD. *Cacteæ*. A genus of three species of very handsome, branched, slender, climbing stove sub-shrubs, all natives of Brazil. Flowers solitary, usually

Epiphyllum—*continued.*

large and showy; tube of corolla furnished with remote unarmed scales, rising from the crenatures of the branches, among small spines; limb of corolla deeply multifid. Branches much compressed, two-edged, thin, but fleshy,

Epiphyllum—*continued.*

habit, they show best when grafted on a small tree-like stock. Although the species are few, the varieties are somewhat numerous, and are nearly all richly coloured and attractive.

FIG. 716. EPIPREMNUM MIRABILE (see page 517).

lobately crenated, green, smooth. Epiphyllums are among the most highly coloured and beautiful of winter-flowering plants. They are not very fast-growing, and are, in consequence, most useful for decorating either large or small plant houses. Being of a dense trailing or dependent

PROPAGATION. This may be effected by short cuttings, taken from the branches, inserted singly in small pots, and placed in heat. The branches being unable to support themselves in an upright position when growing, this plan of cultivation is not much practised, except for use in

Epiphyllum—*continued.*

baskets or in other positions where they are intended to hang down. For growing in pots, the general system adopted for Epiphyllums is to graft them on stocks, that may be first grown from cuttings to almost any desired height. The plants used as stocks are *Pereskia aculeata* and *P. Bleo*. These strike readily in sandy soil, at any season, and should afterwards be potted and grown upright, until they reach the required height, which may vary from 1ft. to 5ft. Grafting is easily performed, as it consists in merely pulling out a short branch just as growth commences, in spring, afterwards opening the stock either on the top or at any part of the side that is sufficiently hard, inserting the back part of the branch, and then passing one of the sharp spines from the *Pereskia* stock right through, to hold all firmly. No other covering need be applied if the plants are in a moist, warm atmosphere. *P. Bleo* grows stronger, and is, on that account, suitable for tall specimens, while *P. aculeata* is more common and is generally used for dwarf or medium-sized standards. By grafting at short distances up the stem, pyramid plants may be obtained by a system of training, that have a fine effect when in flower. Large pyramids have also been grown from cuttings for exhibition purposes.

CULTIVATION. Epiphyllums succeed in sandy loam, with the addition of a little leaf soil and mortar rubbish. Good drainage is necessary, and rather small pots, in proportion to the size of head, will be sufficient. After grafting, the plants should be grown on in heat until autumn, when they should be kept drier, and allowed to rest. Start them again in February, and grow in a light position, allowing plenty of air in the latter part of the summer, to thoroughly ripen the growths. The plants will have formed nice heads by this time, and may be introduced to warmer quarters, for flowering, a few at a time, so as to prolong the season. A temperature of 45deg. will be high enough in the autumn, and only sufficient water to prevent shrivelling should be applied. The flowers will open in a temperature of 60deg., and may then be removed to a cooler position. After flowering, any necessary repotting should be performed, and the same routine again followed. When established in tolerably large pots, it is often best not to disturb the roots, but apply a top-dressing of good soil instead. Epiphyllums increase in size for several years, if they can be kept in good health. They may be used with fine effect to cover the back wall of a stove. A trellis, far enough from the wall to allow of soil being placed for planting, might be fixed, and the soil inclosed and hidden by Selaginellas, or plants of similar habit. For this purpose, plants struck from cuttings are most suitable. The flowers are produced at the ends of the flattened branches.

E. Russellianum (Russell's). *fl.* delicate rose colour. May. This is a form from Brazil, with doubtful specific claims, but sufficiently distinct for horticultural purposes. (B. M. 3717.) There are two or more varieties, including *rubrum*, with much larger bright rosy-red flowers; and *superbum*, with purple flowers, having a white throat.

E. truncatum (truncate).* *fl.* red or rose-coloured, hardly 3in. long, oblique, rising from the truncate tops of the branches; stamens white; corolla reflexed, ringent; tube very short. Branchlets dichotomous, truncate at the apex. Joints of stem compressed. 1818. (B. H. 1866, 15.) SYN. *Cactus truncatus* (B. M. 696). There are several varieties of this fine plant, of which the following is a selection: *bicolor*, white, edged with rose; *coccineum*, rich deep scarlet; *elegans*, bright orange-red, centre rich purple; *magnificum*, flowers large, white, tips bright rose-coloured; *roseum*, bright rose; *Ruckerianum*, deep reddish-purple, with a rich violet centre; *salmoneum*, reddish-salmon; *spectabile*, white, with purple margin; *violaceum*, flowers large, pure white, with delicate purple margin; *violaceum superbum*, pure white, rich deep purple edge.

EPIPHYTES. Plants growing upon the surface of others without deriving any nutriment from them; as, for example, many Orchids and Mosses. They are frequently spoken of as Air Plants.

EPIPREMNUM (from *epi*, upon, and *premnon*, a trunk; in allusion to the species rooting upon the trunks of trees). ORD. *Aroideæ* (*Araceæ*). A genus of about eight species of climbing stove plants, from the Malayan Archipelago and the islands of the Pacific. Spathe thick, boat-shaped; spadix included, thick, cylindrical, dense-flowered. Leaves ovate, ovate-cordate or lanceolate, often large, entire or pinnatifid; petiole sheathing at the base. For culture, *see* **Monstera.**

E. mirabile (wonderful). Tonga Plant. This is an "ornamental climber, of rapid growth, with bold dark green pinnatisect leaves in the adult stage, and large inflorescences, resembling those of a Monstera. It is a very suitable plant for trailing up pillars, trunks of Palms, Tree-ferns, &c., or the back wall of a stove; and, besides its ornamental character, it is specially interesting for the manner in which the plant changes in appearance as it develops from its juvenile state with small entire leaves to its adult flowering stage with large pinnatisect leaves; as well as for its medicinal qualities, which appear to have been long known to the natives of the countries the plant inhabits" (N. E. Brown). Fiji. See page 516, Fig. 716, for which we are indebted to Mr. Wm. Bull.

EPISCIA (from *episkios*, shaded; occurring, in their native habitats, in shady places). As now understood, this genus includes *Alsobia*, *Centrosolenia*, *Cyrtodeira*, *Nautilocalyx*, *Physodeira*, and *Skiophila*. ORD. *Gesneraceæ*. Very beautiful stove herbaceous perennials. About thirty species have been described, all New World plants, dispersed over Central America and the West Indies. Flowers axillary, solitary, or in little cymes; corolla funnel-shaped. Leaves opposite, petiolate, alike or dissimilar. For cultivation, *see* **Gesnera.**

E. bicolor (two-coloured).* *fl.* white, bordered with purple, erect or inclined; calyx hairy, deeply five-cleft into five nearly erect linear-lanceolate sepals, recurved at the apex; corolla white, gibbous on one side at the base, dilated above, tumid beneath, within spotted with purple; tube rather short; peduncles slender, hairy, from the axils of the leaves. *l.* large, hairy, between ovate and cordate, spreading, somewhat glossy, acute, penninerved and coarsely reticulated; petioles short, hairy. *h.* 3in. New Grenada. A somewhat creeping, procumbent plant. (B. M. 4390.)

E. chontalensis (Chontalese).* *fl.* lilac, with a yellow centre, and a whitish tube, nearly 2in. across. November and December. *l.* ovate, or ovate-oblong, acute, sub-cordate at the base, purple on the under side, and light green on the upper surface. *h.* 6in. Nicaragua, 1867. (B. M. 5925.)

E. cupreata (coppery).* This is the correct name of plant described under *Achimenes cupreata*.

E. c. viridifolia (green-leaved). This closely resembles the type, differing from it only in the much larger flowers, and in the absence of the coppery tinge to the foliage. New Grenada, 1860. An elegant plant. (B. M. 5195, under name of *Cyrtodeira cupreata*.)

E. erythropus (red-stalked). *fl.* fascicled in the axils of the leaves, on slender, single-flowered peduncles, about 1in. to 2in. long; calyx divisions subulate lanceolate, quite entire, green; corolla pale flesh-coloured, with orange-purple spots within the yellow throat and tube; limb oblique, nearly flat; lobes orbicular. *l.* sub-radical, oblanceolate, cordate-acuminate, decurrent on the stout petiole, irregularly toothed, bright green above, suffused with red beneath; midrib and petiole very stout, blood-red; nerves many, arching, very red. New Grenada, 1874. (B. M. 6219.)

E. fulgida (shining).* *fl.*, corolla bright and almost vermilion-red; tube hirsute, 1¼in. long, cylindric, nearly straight; limb 1in. in diameter, nearly equal; lobes rounded, irregularly toothed; peduncles axillary, solitary, stout, 1in. to 2in. long. July. *l.* 3in. to 5in. long, elliptic, or elliptic-ovate, acute, crenulate serrate, convex, bullately reticulated on the upper surface, dark emerald green, paler along the midrib, and inclined to coppery. *h.* 6in. New Grenada, 1873. (B. M. 6136.)

E. melittifolia (Melittis-leaved). *fl.*, corolla crimson; tube longer than the calyx, curved downwards, with an obtuse spur at the base above; limb of five, nearly equal, rounded, spreading lobes; peduncles few, rarely single-flowered. April, May. *l.* upon long petioles, large, nearly elliptical, obtuse at the base, acute at the apex; margin coarsely doubly crenate, dark green, glossy, wrinkled above, with the sunk reticulated veins; pale beneath. *h.* 1ft. Dominica, 1853. (B. M. 4720.)

E. villosa (shaggy).* *fl.* axillary, generally ternate and spreading, so as to form pseudo-verticils; pedicels short, single-flowered; calyx gibbous at the base, above deeply cut into five large, much acuminated segments; corolla white, villous externally, the tube gibbous at the base above, curved, compressed, the mouth spreading, within on the lower side marked with purple rounded lobes. May and June. *l.* opposite, petioled, ovate, acute or acuminate, coarsely serrated, villous with spreading hair, strongly reticulated and rugose, the nerves prominent beneath, and then tomentose; petioles thick, woolly, and villous. Branches erect, obtusely tetragonal, thickly hairy and woolly. *h.* 1ft. to 1½ft. Surinam. A distinct and handsome species. (B. M. 4866, under name of *Drymonia villosa*.)

EPISTEPHIUM (from *epi*, upon, and *stephas*, a crown; at the base of the perianth there is a small toothed calyculus). ORD. *Orchideæ*. A genus of half-a-dozen species of beautiful stove terrestrial Orchids, allied to *Sobralia*, natives of Southern tropical America. Roots fleshy, fibrous, underground. Perhaps the only one which has been introduced is that here described. It thrives in good fibrous loam and sand; perfect drainage and copious supplies of water are essential elements in its culture. Propagated by division.

E. Williamsii (Williams's).* *fl.* bright reddish-purple, large; spike terminal, six to eight-flowered. *l.* very dark, shining. *h.* 1ft. Bahia, 1864. (B. M. 5485.)

EQUISETACEÆ. An order of interesting cryptogams, which takes its name from the genus *Equisetum*, the only one the order contains. There are about twenty-five species, chiefly found in temperate Northern regions; a few are sub-tropical. One of the latter group (*E. Martii*), recently introduced to Kew from Brazil, attains, in its native habitats, the enormous height of 30ft. "Dutch Rushes," used for scouring and polishing, are the stems of *E. hyemale*; their roughness is due to a deposit of siliceous particles in the epidermis.

EQUISETUM (from *equi*, of a horse, and *seta*, a hair). Horsetail. ORD. *Equisetaceæ*. A genus of leafless herbs, with a perennial, usually creeping rootstock, and erect, Rush-like hollow and jointed stems, marked with longitudinal furrows, with a sheath at each joint, inclosing the base of the next internode. Some of the species of this neglected genus are well worth growing in wet, shady spots, and in similar situations in the rock garden. Increased by division.

E. maximum (largest). *cones* large. Sterile stems 3ft. to 6ft. high, twenty to forty-grooved, furnished with whorls of slender, sub-erect branches. Fertile stem stout, about 1ft. high, with many pale-brown sheaths; teeth two-ribbed. Northern hemisphere (Britain). A very fine plant when well grown. SYN. *E. Telmateia*.

E. sylvaticum (wood).* *cones* ovoid-oblong, obtuse. Stems ten to eighteen-grooved; branches recurved or deflexed, divided; stem sheaths lax; teeth long, obtuse; teeth of branch sheaths three-ribbed to the top. Northern hemisphere (Britain). A very pretty plant for pot culture in a conservatory. Readily recognised by the elegant appearance of the whorls of compound, recurved branches.

E. Telmateia (Telmateia). A synonym of *E. maximum*.

EQUITANT. When the two sides of a leaf are brought together, and adhere except at the base, where they inclose an opposite leaf, whose sides are in the same state. Hence they look as if they rode on each other.

ERAGROSTIS (from *eros*, love, and *agrostis*, grass; alluding to the pretty dancing spikelets). Love Grass. ORD. *Gramineæ*. A genus of about 100 species of annual or perennial grasses (of which two or three are almost cosmopolitan), found in all warm and temperate regions. Some make decidedly pretty garden plants; and are easily grown from seeds, sown in the open, in spring. The best are: *ægyptiaca*, *capillaris*, *elegans*, and *megastachya*.

ERANTHEMUM (from *eran*, to love, and *anthemon*, a flower; referring to the beauty of the flowers). ORD. *Acanthaceæ*. A genus containing about thirty species of handsome stove plants, of elegant and free-flowering habit. They are found in the warmer regions of both hemispheres. Propagated by cuttings, which may be inserted at any time from March to June. Being soft-wooded subjects, the young shoots root readily in peaty soil, if placed in a close frame, or under a bell glass, where there is a bottom heat of 70deg. When rooted, the plants should be potted off singly in 3in. pots, in a compost of equal parts leaf mould, peat, and loam, with the addition of a little sand. If again placed in bottom heat, the plants root and grow rapidly. As they advance in size, they should be potted on, and stood near the glass, supplying an abundance of water

Eranthemum—*continued.*

in warm weather. This induces a stubby growth, which favours free-flowering. A side shelf in the plant stove, near the light, or a raised bed in the same structure, are good positions for bringing Eranthemums into flower. The plants may be cut back after blossoming, and kept somewhat dry for a time; they should then be potted into larger sizes for another season. Some species are cultivated chiefly for their handsome variegated foliage, and others for their floral beauty. *E. atropurpureum* is a fine species, with dark coloured foliage; and *E. pulchellum* has beautiful blue flowers, that are produced in winter and early spring.

E. albo-marginatum (white-margined).* *l.* oblong-elliptic, 4in. to 6in. long, 2in. to 3in. broad, broadly margined with white, and irregularly suffused with grey. Polynesia, 1880.

E. Andersoni (Anderson's). *fl.* numerously disposed in long terminal leafless cymulose spikes or panicles; corolla with the two upper and lateral lobes pure white, and the lower segments very thickly dotted with crimson-lake and broadly margined with white. November. *l.* ovate-oblong. India, 1868. (B. M. 5771.)

E. aspersum (sprinkled).* *fl.* white, spotted with purple, produced freely in short axillary clusters; lower larger lobe rich deep purple. March. *l.* ovate-oblong, 2in. long, dark green, veined at the margins. Solomon Isles, 1867. A handsome slender-growing species. (B. M. 5711.)

E. atropurpureum (dark purple).* *l.* and stems dark lurid purple. Polynesia, 1875.

E. cinnabarinum (cinnabar).* *fl.* reddish-pink, disposed in loose panicles from the ends of the branches. *l.* ovate-lanceolate, acuminate, deep green. Martaban, 1880. A very handsome species. (R. G. 916.) There is a pretty variety (*ocellatum*) of this, having crimson flowers with a white eye (B. M. 5921).

E. Cooperi (Cooper's). *fl.* white, handsomely spotted with lines of small purple dots, axillary. June. *l.* 3in. long, 5in. wide, narrow-lanceolate, dark green; margins deeply cut. New Caledonia, 1864. A handsome sub-shrubby plant. (B. M. 5467.)

E. crenulatum grandiflorum (large-flowered scolloped). *fl.* pinkish-lilac; racemes terminal, aggregated; corolla funnel-shaped, with a very slender, almost filiform, white tube, dilated at the throat; pedicels very short, small, approximate or remote, subtended by one or two small bracts. *l.* rather long-petioled ovate, sometimes cordate at the base, or lanceolate, acuminate, penniveined, generally quite entire at the margin. *h.* 1ft. to 2ft. Moulmein, 1864. A moderate-sized glabrous shrub.

E. eldorado (El Dorado). *l.* yellow, mottled and veined with green. Polynesia, 1877.

E. laxiflorum (loose-flowered). *fl.* purplish, disposed in terminal panicles. *l.* ovate-oblong, tapering at both ends. *h.* 2ft. to 4ft. Polynesia, 1877. (B. M. 6336.)

E. Moorei (Moore's). *l.* with a dull sap-green centre, which gradually softens off to a bright canary-yellow. It is very curious and distinct. Polynesia.

E. pulchellum (pretty).* *fl.* of a rich bright blue, very freely produced. April. *l.* petiolate, broadly ovate, dark green; surface somewhat wrinkled. *h.* 2ft. East India, 1796. One of the prettiest of the genus for winter decoration. (A. B. R. ii. 88.)

E. reticulatum (reticulated).* *l.* ovate-lanceolate, green, with a network of gold. Polynesia, 1875. SYN. *E. Schomburgkii*. (I. H. n. s. 349.)

E. Schomburgkii (Schomburgk's). A synonym of *E. reticulatum*.

E. tricolor (three-coloured). *l.* opposite or ternate, oblong-ovate, olive-green, blotched irregularly with greyish-purple and salmony-pink; tints more or less varied. Polynesia, 1876.

E. tuberculatum (tuberculated).* *fl.* pure white, nearly 1½in. across. *l.* dense, small, oval. New Caledonia, 1863. An elegant species, branching freely into slender twigs, tuberculated. (B. M. 5405.)

E. variabile (variable). *l.* lanceolate, with an irregular outline, 3in. to 4in. long, 1in. broad, variegated with different tints of bronzy-green, intermixed with creamy-white, crimson, and rosy-pink. 1879. A slender-growing plant, varying considerably in colour and habit. (P. M. B. xiii. 75.)

ERANTHIS (from *er*, spring, and *anthos*, a flower; flowers produced early in the year). Winter Aconite. ORD. *Ranunculaceæ*. A genus of a couple of species of pretty little hardy tuberous-rooted perennials. Flowers yellow, solitary; sepals narrow. Leaves divided. These plants, from their very early flowering habit, are extensively grown for naturalising in shrubby or woody situations, for which they are well adapted. Increased by division.

E. hyemalis (winter).* *fl.* yellow, sessile; sepals six to eight, oblong, petal-like; petals six to eight, very short, tubular.

Eranthis—*continued.*

January to March. *l.* deeply divided; involucre of three deeply-cut leaves. *h.* 3in. to 8in. Western Europe, 1596. See Fig. 717. (Sy. En. B. 43.)

FIG. 717. ERANTHIS HYEMALIS.

E. sibirica (Siberian).* *fl.* yellow; sepals five, oval, petal-like. March and April. *h.* 3in. Siberia, 1826.

ERCILLA (said to be the native Peruvian name). ORD. *Phytolaccaceæ.* A hardy evergreen creeper, with stalked, alternate, entire, sub-coriaceous leaves, adhering to walls, &c., like Ivy.

E. spicata (spicate).* *fl.* purplish, in dense sessile racemes. *l.* roundish-ovate. Chili, 1840. An excellent plant for covering walls. (G. C. n. s., ix., p. 653.)

EREMIA (from *eremos*, solitary; in reference to the seeds being solitary in the cells). ORD. *Ericaceæ.* A genus of about ten species of diffusely-branched, Heath-like, greenhouse evergreen shrubs, natives of South Africa. For cultivation, *see* **Erica.**

E. Totta (Hottentot). *fl.* red, glomerate; corolla urceolar, with a small four-lobed limb. June. *l.* spreading, hispid from bristles. *h.* 2ft. 1810.

EREMOSTACHYS (from *eremos*, deserted, and *stachys*, a spike; alluding to the flowers growing in sparse verticillate spikes). ORD. *Labiatæ.* Very pretty hardy perennials. All are natives of Western and Central Asia. Upper lip of corolla elongated, galeate, somewhat compressed, attenuated at the base. Leaves pinnate or pinnatifid. They are of very easy culture in a light rich soil, and may be increased by division or seed. There are about twenty-seven species in this genus, but that given below is perhaps the only one in cultivation.

E. laciniata (cut-leaved). *fl.* yellow; whorls ten to twenty-flowered, upper ones approximate. July. *l.* pinnatisect; segments oblong-lanceolate or linear, deeply pinnatifid; radical ones 6in. long. Stems nearly simple. *h.* 1ft. to 1½ft. Levant, 1731. (B. R. 1845, 52.)

EREMURUS (from *eremos*, solitary, and *oura*, a tail; referring to the flower-spike). ORD. *Liliaceæ.* A genus of about eighteen species of very pretty, hardy herbaceous, large, Hyacinth-like perennials, extending from Asiatic Russia to Hindostan. Scape naked, terminating in an elongated raceme of yellow or white flowers; perianth segments narrow, spreading. Leaves radical, linear. They are of easy culture, in moderately good garden soil. Increased by divisions.

E. himalaicus (Himalayan).* *fl.* white, star-shaped; scape 1½ft. to 2ft. in height, bearing a densely packed raceme. *l.* strap-shaped, acute, glabrous, entire, about 1ft. in length. Himalaya, 1881. (G. C. n. s., xvi. 49.)

E. Korolkowi (Korolkow's) is a rare and handsome species, from Central Asia, growing from 3ft. to 4ft. high, and bearing immense spikes of bright rose flowers.

E. Olgæ (Olga's). *fl.* white, star-shaped, with projecting stamens; disposed in a long dense raceme. Summer. *l.* tufted, linear, scabrous, recurved. Turkestan, 1881. (R. G. 1048.)

E. robustus (robust).* *fl.* peach-coloured, disposed in an elongated raceme on a naked scape, from 8ft. to 9ft. in height. *l.* rosette-formed, 4in. wide, and from 2½ft. to 3ft. long. Turkestan, 1874. (B. M. 6726; R. G. 769.)

E. spectabilis (showy).* *fl.* sulphur-coloured; raceme elongated, sub-cylindrical, many-flowered; perianth divided to the very base, with six ovate-elliptical, spreading, sulphur-coloured sepals,

Eremurus—*continued.*

slightly tinged with orange; anthers oblong, deep orange. June. *l.* radical, linear-ligulate, glaucous-green, slightly channelled and obscurely keeled, sheathing at base. *h.* 2ft. Siberia, 1800. (B. M. 4870.)

E. turkestanicus (Turkestan). *fl.* reddish-brown; perianth segments margined with white; stamens much exserted; raceme very long and dense, borne on a tall scape. *l.* broad-linear, acuminate. *h.* 4ft. Turkestan, 1881. (R. G. 997.)

ERIA (from *erion*, wool; the leaves of some of the species are downy). SYN. *Pinalia.* Including *Porpax* (of Lindley). ORD. *Orchideæ.* A genus of about 120 species of stove epiphytal Orchids, natives of India, South China, and the Malay Archipelago. They are allied to *Stanhopea.* Flowers solitary or racemose, lateral or apparently terminal on the leafy stems or pseudo-bulbs; column short, produced at the base in a foot. Leaves variable. Few of the species are grown, being generally more curious than pretty. For culture, *see* **Stanhopea.**

E. clavicaulis (club-stemmed). *fl.* white; lip bordered with pink. India, 1837.

E. convallarioides (Convallaria-like). *fl.* white, small; racemes dense, oblong, drooping, on short peduncles. August. *l.* oblong-lanceolate. Stems compressed, densely and loosely sheathed. India, Nepaul, 1839. (B. R. 1841, 62.)

E. extinctoria (extinguisher-spurred). *fl.* solitary, ⅛in. to ¼in. long; posterior sepal ovate, acute, white, or tinged with rose; lateral sepals obliquely ovate, acute, equalling the posterior sepal, produced below and adnate to the column, forming an extinguisher-like, obtuse or retuse, slightly curved, greenish-tipped spur; lateral petals oblong or oblanceolate, nearly equalling the sepals, white or faint blush; labellum narrowed below into a distinct claw, with three sub-prominent, papillose, longitudinal ridges, more or less orange below, and on the median line, transversely blotched with rose-purple above. Birma, 1871. A very remarkable leafless species. (B. M. 5910.)

E. floribunda (bundle-flowered). *fl.* white, or tinged with red, small, but very numerous, in pendulous racemes, not unfrequently 8in. to 10in. long. Summer. *l.* lanceolate-acuminate. Stems fleshy, rather flexuous, terete. Singapore, Borneo, 1842. (B. R. 1844, 20.)

E. myristicæformis (Nutmeg-bulbed). *fl.* white, medium size, sweet-scented; racemes erect, shorter than the leaves; bracts about as long as the pedicel, oblong, acuminate, white, reflexed; labellum forming a spur at its union with the produced base of the column, three-lobed; disk bearing two orange-coloured glands. September. *l.* two, lanceolate-spathulate. Pseudo-bulbs aggregated, oblong, green; the old bulbs remain, and partake much of the shape of nutmegs (whence the specific name). Moulmein, 1863. (B. M. 5415.)

E. obesa (fat). *fl.* white, scarcely tinged with pale pink, very much resembling those of *Dendrobium*; racemes arising from the leafless pseudo-bulbs, 3in. to 4in. long; labellum oblong, obscurely three-lobed. February. *l.* two, terminal. Pseudo-bulbs oblong-oval, tapering at each end, 2in. to 3in. long and 1in. broad in the thickest part. Malayan Peninsula, 1863. (B. M. 5391.)

E. stellata (star-bearing). *fl.* yellowish-red, stellate, in a long curved raceme, 1ft. to 1¼ft. long, fragrant; perianth pale yellow-green; sepals and petals nearly equal, linear-lanceolate, spreading; lip lanceolate, three-lobed, almost parallel with the column. April. *l.* two, broadly-lanceolate, marked with five longitudinal ribs. *h.* 2ft. Java (?), 1837. A very desirable plant. (B. M. 3605.)

E. vestita (clothed). *fl.* reddish-brown without, white within, medium size; racemes long, pendulous, flexuous. *l.* coriaceous, lanceolate. Indian Archipelago, 1869. SYN. *Dendrobium vestitum.* (B. M. 5807.)

ERIANTHUS (from *erion*, wool, and *anthos*, a flower; referring to the tuft of hairs at the base of each spikelet). SYN. *Pipidium.* ORD. *Gramineæ.* This genus comprises about a dozen species of hardy and half-hardy grasses, found in most warm regions.

E. Ravennæ (Ravenna)* is a very handsome and stately hardy grass, from South Europe. Its foliage forms dense tufts in a light soil; the flowering stems sometimes attain a height of from 5ft. to 6½ft., but these are only produced in very warm summers. It is an excellent plant for the sub-tropical garden.

ERICA (*Erica*, of Pliny, is altered from *Ereike* of Theophrastus; there is probably no ground for the ordinary derivation from *erico*, or *ereiko*, to break). Heath. ORD. *Ericaceæ.* A very extensive genus (about 400 species) of greenhouse or hardy evergreen, branching, wiry shrubs, natives, for the most part, of the Cape of Good Hope. Flowers usually nodding, axillary or terminal, fascicled or racemose; pedicels two to three-bracteate; corolla persistent, with a four-lobed limb; stamens eight. Leaves opposite,

Erica—*continued.*

alternate or verticillate, rigid, small. Cape Ericas are among the most beautiful of decorative cool-house plants. A great diversity in colour and form of flower, marks the genus as now represented in gardens. The type of form of corolla in a large number of species is shown at Fig. 718. Probably no class of plants require more

FIG. 718. URCEOLATE COROLLA OF ERICA.

careful attention for their successful cultivation, than do the majority of the species of the hardest-wooded Heaths. Many of these are not now in cultivation, their places being filled by numerous kinds of hybrid origin. Some of the softer-wooded kinds, such as *caffra*, *colorans*, *gracilis* (with its variety *autumnalis*), *hybrida*, *hyemalis*, *melanthera*, *persoluta* (var. *alba*), *ventricosa coccinea minor* and *Wilmoreana*, are grown in immense quantities to supply the ever-increasing demand for useful decorative plants such as these Heaths invariably make. They flower principally in autumn and winter, although the majority of the species blossom during spring and early summer. Ericas, especially the harder-wooded sorts, are liable to die suddenly from some often unknown cause, though careless potting or watering very frequently proves fatal to them.

Many of the hardy species are very attractive and useful for culture in peaty soil, as an edging to other shrubs, particularly the dwarf *E. carnea*, or even *E. vagans*. The other taller-growing species are showy when planted in beds by themselves, or with a dwarf one as an edging. They may be increased by division or layers, or by cuttings, placed in sandy peat, under handlights, in autumn.

PROPAGATION. Heaths may be readily grown from seed, a method which is, however, now seldom resorted to except for the raising of new varieties, the most commonly practised means for their propagation being that of cuttings. These are obtained from the points of the twiggy ripened shoots about the lower parts of the plants. The soft-wooded varieties, which commence to make new growth early in the year, will be found to yield good cuttings before the others, that are later in flowering, and consequently do not start growing again quite so early as the softer kinds. The cuttings should be about 1in. long, and, after the lower leaves have been carefully removed, be inserted rather closely in pots, which should be filled with two-thirds of crocks, the remainder being fine sandy peat with a layer of clean silver sand on the surface, and covered with a bell glass, or placed in a close-fitting handlight. After being once well watered, they should be placed in a temperature of about 60deg. The glasses will require to be rather frequently wiped dry inside, and any appearance of mould or damp on the cuttings must be sought for, and immediately removed. When growth commences, air should be very gradually admitted, and the young plants exposed to more light. They may be stopped, and remain in these pots until early the following spring, when they should be potted singly, and grown on. The same remarks apply to all greenhouse Heaths; the hardest-wooded ones are inserted later in the season, and are the most difficult to increase.

CULTIVATION. The soil used for potting Ericas, at any stage, must be good fibrous peat, broken in small lumps, with nearly one-third of clean silver sand added. Thorough drainage is at all times essential; and, to keep the compost open, the admixture of a few pieces of crock, broken fine, is advisable. The plants should never be allowed to become pot-bound, especially when young. The roots

Erica—*continued.*

are seldom altogether inactive; and the best season for repotting any that require it is as soon as new growth commences in spring, or, with established late-flowering sorts, early autumn. The balls should not be disturbed, excepting what becomes absolutely necessary in removing the crocks; and the new soil should be rammed as firmly as the old, to prevent water passing more freely through one part than another. It is also very important that the ball should not be placed low enough to allow the stem of the plant to be buried. This condition alone, when neglected, is liable to cause the death of any number of Ericas. Anything approaching a close atmosphere must, at all times, be avoided, as this encourages the development of mildew on the leaves. When the plants are established in the summer months, a cold frame is the best place, and too much light and air cannot be given. Indeed, in dry open weather, the sashes are better removed. With the hard-wooded sorts, care must be taken to prevent water lodging amongst the leaves, or damping will result. The pots should be plunged in summer, to prevent injury to the tender roots. Exposure of established plants to sun and air, from the latter part of July till the end of September, tends greatly to ripen and solidify the growths, thus causing the greater production of flowers. For wintering Ericas, a span-roofed house, with plenty of light and available means of ventilation, is most suitable. They dislike fire heat, and it should never be applied, except to keep out frost, or occasionally to expel damp. A temperature of 40deg. in severe weather will be more suitable than one higher; and when it is mild, plenty of air should be admitted.

Watering is a matter of great importance at all seasons, perhaps more so than with any other class of plants. If possible, soft rain water should always be used, or some that has been exposed to sun and air in an open cistern. The plants must never be allowed to become dry; and, on the other hand, too much water, especially with individuals in bad health, is equally injurious. They should be examined each time, and watered according as experience alone can teach. The use of hard water, which invariably contains lime, often proves destructive, and should be avoided if possible. Where none but hard water is available, it may be made more suitable for Heaths by placing a bag of soot in the tank or tub, where it is kept.

The best time for pruning is as soon as the flowering season is over. The softer-wooded and freer-growing kinds should have all their strongest shoots shortened back to within an inch or two of their bases, and all the weaker ones should have their tips removed. In some cases, it will only be necessary to shorten a few of the strongest ones to induce a symmetrical habit. Some of the slow-growing sorts rarely require pruning at all. Heaths are seldom subject to attacks from insect pests—mildew being the disease to which they are most liable. This may be destroyed by dusting the affected part with flowers of sulphur, previously moistening the plant. It may be allowed to remain on the plant for several days, and be then washed off with clean water, taking care not to allow any sulphur to get in the soil.

In addition to the following enumeration, it may be stated that the number of hybrids and varieties now in cultivation is very considerable, and limited space deters us from describing more of them. Indoor treatment is required except where otherwise stated.

E. Aitonia (Aiton's).* *fl.* pale red, or nearly white, terminal, three to four together; corolla viscid, with a cylindrical tube 1in. long, which is ventricose at top, with large ovate segments. June to September. *l.* three in a whorl, linear, serrulated, erect. *h.* 2ft. 1790. A slender branching species. SYN. *E. Aitoniana*. See Fig. 719. (B. M. 429.)

E. A. superba (superb). An improved form of the type, with larger tubes, and a more compact habit of growth.

E. A. turgida (turgid). *fl.* in terminal umbels; tubes swollen at

Erica—*continued.*

the base, and contracted above the middle, enlarging slightly at the mouth.

E. A. Turnbullii (Turnbull's). *fl.* in umbels of about six; tube upwards of 1in. long, as thick again as those of the type; corolla lobes large, spreading, white, changing to pink. *l.* broader than in the type.

FIG. 719. ERICA AITONIA, showing Flowering Branch and detached Single Flower.

E. Aitoniana (Aiton's). A synonym of *E. Aitonia.*

E. alopecuroides (fox-tail-like). *fl.* terminal; corolla purplish-red, ovate, small; calyx coloured, ciliated. September and October. *l.* linear, three in a whorl. *h.* 1ft. 1810. (L. B. C. 874.)

E. ampullacea (flask-shaped).* *fl.* red, terminal, usually in fours; corolla nearly 1in. long, viscid, with a ventricose tube, ribbed neck, and ovate-cordate, slightly crenulated, obtuse segments. July. *l.* three or four in a whorl, lanceolate, reflexed, imbricate at the base. *h.* 2ft. 1790. (B. M. 303.)

E. andromedæflora (Andromeda-flowered).* *fl.* deep red, or reddish-purple, solitary, drooping, axillary; corolla urceolate; calyx pink, nearly as long as the corolla. March to June. *l.* three in a whorl, ciliated, subulate, stiff, spreading. *h.* 1ft. to 3ft. 1803. (B. M. 1250.)

E. arborea (tree-like). *fl.* white, axillary, racemose, small; corolla two lines long, campanulate. February to May. *l.* three or four in a whorl, linear, glabrous. Branches tomentose. *h.* 10ft. to 20ft. South Europe, 1658. Hardy. (S. F. G. 351.) There are several varieties of this species.

E. Archeriana (Lady Archer's). *fl.* about 1in. long, axillary and terminal, crowded, verticillate; corolla deep reddish-purple or scarlet, downy, viscid, with a cylindrical, inflated tube. August and September. *l.* six to seven in a whorl, serrulately ciliated, spreading. 1786. (L. B. C. 1466.)

E. aristata (awned). *fl.* terminal; corolla reddish-purple, with a paler limb, salver-shaped, inflated upwards with revolute projecting segments. March to August. *l.* four to five in a whorl, oblong, sub-secund, hispid, imbricated, awned at the apex. *h.* 1ft. to 2ft. 1801. (B. M. 1249.)

E. a. Barnesii (Barnes').* *fl.* produced in terminal whorls; corolla tube shining red: mouth deeper red than in type; segments very broad, pure white. A very handsome hybrid.

E. a. virens (green) is closely allied to the last, but has four leaves in a whorl, not five, and the clusters of flowers are larger.

E. Austiniana (Austin's).* *fl.* in whorls; corolla tubular; tubes white, streaked and suffused with carmine, narrow, 1in. or more in length. July and August. *l.* ovate-lanceolate, smooth, spreading. An excellent species.

E. australis (Southern). *fl.* terminal, small; corolla purplish-

Erica—*continued.*

red, three lines long, with a curved, funnel-shaped tube, and a recurved limb; anthers crested. March to July. *l.* four in a whorl, scabrous, spreading, mucronate. *h.* 3ft. to 6ft. Spain, 1769. Hardy. (L. B. C. 1472.)

E. Banksiana (Banks'). *fl.* terminal; corolla greenish-yellow, cylindrical, with a reflexed limb; anthers brown. February. *l.* mucronate, loosely imbricated, three or four in a whorl. *h.* 9in. 1787. (A. H. iii. 105.)

E. Beaumontiana (Beaumont's).* *fl.* axillary and terminal, drooping; corolla white, tinged with purple, campanulate; style a little exserted. June. *l.* linear, five to six in a whorl. *h.* 1ft. 1820. (A. H. vi. 253.)

E. Bergiana (Bergius').* *fl.* terminal, drooping; corolla purple, campanulate, smooth; calyx reflexed, ciliated. May and June. *l.* linear-oblong, pubescent, spreading. Peduncles hairy, with a few scaly bracts. *h.* 1½ft. 1787. (L. B. C. 939.)

E. blanda (charming). *fl.* terminal, clustered; corolla pale red, one and one-third lines long, having the limb one-half longer than the tube, with semi-orbicular segments. May. *l.* three in a whorl, spreading, short, obtuse. *h.* 2ft. 1798. (A. H. iii. 152.)

E. Bonplandiana (Bonpland's). *fl.* terminating the small branches, solitary or by threes, sessile; corolla white, large, with an urceolar tube, and an acute, spreading limb. March to September. *l.* four in a whorl, imbricate, acerose. *h.* 1ft. 1812. (B. M. 2126.)

E. Bowieana (Bowie's).* *fl.* crowded, axillary, verticillate, near the tops of the branches, pendulous; corolla cylindrical, with an inflated tube and contracted mouth. October. *l.* linear, glaucous, glabrous. *h.* 1ft. 1822. (L. B. C. 842.)

E. brunïades (Brunia-like). *fl.* in small pendulous umbels; corolla pink; stamens black; calyx covered with long white woolly hairs. May. *l.* short, linear-oblong, clothed with white woolly hairs, as are also the branches. *h.* 1½ft. 1774. (A. H. i. 6.)

E. caffra (Caffrarian).* *fl.* sweet-scented; corolla globular, very small, produced in great profusion. *h.* 1½ft. 1802. (A. H. i. 7.)

E. campanulata (bell-shaped). *fl.* terminal, solitary, drooping; corolla yellow, two and a-half lines long, campanulate. April to August. *l.* three in a whorl, subulate, glabrous. *h.* 1ft. 1791. (A. H. ii. 55.)

E. Candolleana (Candolle's).* *fl.* umbellate; corolla rosy-red at the base, white towards the apex, more than 1in. long. June, July. *l.* erect, somewhat oblong, clothed with long hairs at the edges. Hybrid.

E. carnea (flesh-coloured).* *fl.* pale red, axillary, drooping, disposed in secund racemes; corolla conical, two and a-half lines

FIG. 720. ERICA CERINTHOIDES, showing Flowering Branch and detached Single Flower.

Erica—*continued.*

long, with a pyramidal tube. January to April. *l.* three to four in a whorl, linear, glabrous. *h.* 6in. Germany, 1763. Hardy. The white-flowered form is generally called *E. herbacea*. (L. B. C. 1452.)

E. Cavendishiana (Cavendish's).* *fl.* rich bright yellow, tubular, nearly 1in. long, stout. May to July. *l.* subulate, slightly spreading, bright dark green. *h.* 1½ft. Hybrid. (P. M. B. xiii. 3.)

E. cerinthoides (Honeywort-like).* *fl.* terminal, capitate, drooping; corolla scarlet, nearly 1in. long, oblong, with an inflated tube, clothed with viscid hairs outside. May to November. *l.* five to six in a whorl, linear-lanceolate, pilose and ciliated, bearded at the apex. *h.* 3ft. 1774. There are several garden forms of this speciœs. See Fig. 720. (B. M. 220.)

E. Chamissonis (Chamisso's).* *fl.* rose-coloured, at the tips of short side branches, solitary, or three or four together, pendulous; pedicel pink, ¼in. long; corolla between globose and campanulate; lobes very short and broad. April. *l.* long, ternate, spreading, and incurved, sessile, linear, obtuse, grooved underneath from the recurvation of the margin. Branches slender, leafy, erect. *h.* 1½ft. South Africa, 1874. An elegant plant. (B. M. 6108.)

E. ciliaris (fringed).* *fl.* terminal, sub-racemose, secund; corolla pale red, four lines long, smooth, ovate, more ventricose on the upper side. August, September. *l.* three in a whorl, ovate, glandularly ciliated, spreading, rather remote. *h.* 1ft. Western Europe (Cornwall and Dorset). (B. M. 484; Sy. En. B. 887.)

E. cinerea (ashy-grey). *fl.* verticillate, on the naked stems; corolla purple, changing to blue as it fades, three lines long, ovate-urceolate. August, September. *l.* three in a whorl. *h.* 6in. to 12in. Europe (Britain). (Sy. En. B. 891.) There are several varieties, including a white-flowered one, of this species.

E. codonodes (bell-bearing). *fl.* white and pink, small, disposed in numerous densely-crowded racemes. *l.* acerose, three to five in a whorl. *h.* 8ft. South Europe. A slender much-branched hardy shrub, closely allied to *E. arborea*, of which it is probably only a variety. (G. C. n. s., vii. 463.)

E. colorans (colouring).* *fl.* crowded, terminating the small branches; corolla varying from red to white, cylindrical, clavate, glabrous. April to June. *l.* linear, spreading, ciliated. *h.* 2ft. 1817. (B. R. 601.) A garden variety, named *superba*, with rosy-red and white flowers, is said to be an improvement on the typical species.

E. comosa (tufted). *fl.* small, terminal, tufted; corolla white, with an ovate ventricose tube, and dark anthers. April to August. *l.* four in a whorl, linear, short, erectly spreading. *h.* 9in. 1787. (A. H. i. 10.)

E. cylindrica (cylindrical). A synonym of *E. hybrida*.

E. delecta choice). A synonym of *E. primuloides*.

E. densa (dense). *fl.* axillary, crowded, nearly sessile; corolla pale red, with an oblong-cylindrical tube, and a short spreading limb. May to October. *l.* four or five in a whorl, linear, somewhat imbricated, spreading. *h.* 1½ft. 1810. (A. H. v. 212.)

E. denticulata (denticulate). *fl.* terminal, fastigiate; corolla purple, three lines long, with a cylindrical tube. April, May. *l.* four in a whorl, linear, glabrous. *h.* 1ft. 1821. (L. B. C. 1090.)

E. depressa (depressed). *fl.* small, terminal; corolla white, bell-shaped. July. *l.* glabrous, three in a whorl, linear, revolute. Branches decumbent. 1789. (A. H. i. 17.)

E. Devoniana (Devon).* *fl.* umbellate; corolla rich purple, tubular, inflated at the base, about 1in. long. Summer. *l.* broad, bluntly-oblong, recurved, ciliated. Hybrid.

E. Douglasii (Douglas's). *fl.* umbellate; corolla flesh-colour, about 1in. long, with large spreading white segments. June, July. *l.* short, blunt, spreading, awned. Hybrid.

E. echiiflora (Echium-flowered).* *fl.* axillary, horizontal and spicate; corolla deep red, with a short, inflated, ribbed tube, clammy. March to May. *l.* five to seven in a whorl, linear, downy, with rough margins, spreading. *h.* 1½ft. 1798. (A. H. iv. 161.)

E. effusa (effuse). *fl.* ten to twelve in a large terminal whorl; corolla bright scarlet-crimson, tubular; segments reflexed, pale yellow. August. *l.* spreading, ciliated. Hybrid.

E. elegans (elegant).* *fl.* terminal, numerous, capitate; corolla pink, tipped with green, urceolate, with a contracted four-toothed mouth; calyx bright rosy-red, nearly as large as the corolla. Summer. *l.* three in a whorl, linear, glaucous, spreading. *h.* 6in. to 12in. 1799. (B. M. 966.) The variety *glauca* has larger flowers, and more erect glaucous leaves, than the type.

E. empetrifolia (Empetrum-leaved). *fl.* purplish-red, disposed in glomerate racemose whorls; corolla two lines long, hairy, with an urceolar tube and a recurvedly-spreading limb. May and June. *l.* six or seven in a whorl, oblong-linear, ciliated, erect. 1774. (B. M. 447.)

E. Eweriana (Ewer's). *fl.* sub-spicate; corolla dark red, with a greenish-yellow mouth, cylindrical, eight to ten lines long, clothed with viscid down, curved and clavate. July to November. *l.* linear, scabrous, spreading. *h.* 2ft. 1790. (L. B. C. 1303.)

E. eximia (choice).* *fl.* produced in whorls; corolla scarlet, tipped with green, tubular, about 1in. long. May and June. *l.* linear, slightly spreading, hairy. *h.* 2ft. 1800. (L. B. C. 1105.)

Erica—*continued.*

E. exsurgens (rising). *fl.* axillary, verticillate, horizontal, crowded; corolla orange-red, cylindrically clavate, thirteen to fifteen lines long, viscid, with ovate-cuneated segments. March to October. *l.* filiform, spreadingly recurved. *h.* 1½ft. 1792. (A. H. i. 20, 21.)

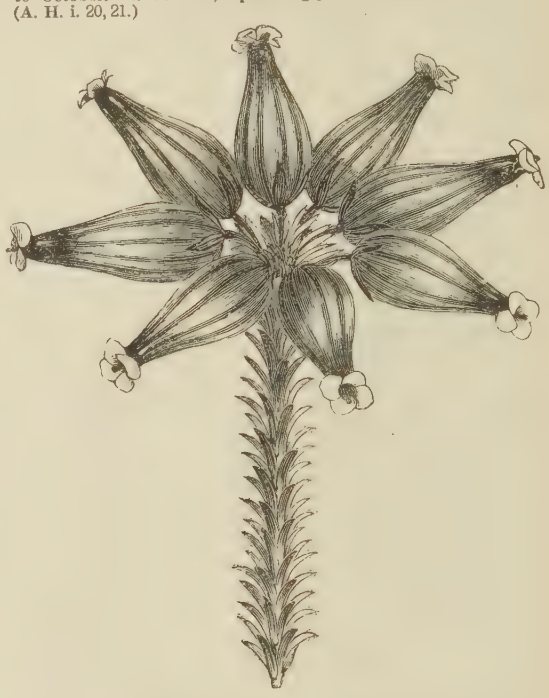


FIG. 721. FLOWERING BRANCH OF ERICA FAIRIEANA.

E. Fairieana (Fairie's).* *fl.* in terminal whorls; corolla tube rich rose, 1in. long, much inflated at the base, suddenly contracted at top; limb white. June to August. *l.* large, oblong-lanceolate, with long white hairs at the edges. Hybrid. See Fig. 721. (R. H. 1880, 467.)

E. fastigiata (fastigiate). *fl.* terminal, crowded, sessile; corolla white, salver-shaped, with a narrow tube. May to September. *l.* four in a whorl, acerose, shining, erect, imbricated. *h.* 1½ft. 1797. (A. H. ii. 62.)

E. ferruginea (rusty-coloured). *fl.* terminal, umbellately verticillate, horizontal; corolla with red, acuminated, inflated tube, and a greenish-yellow limb. May. *l.* four in a whorl, linear, secund, ciliated with rusty hairs. *h.* 1ft. 1798. (A. H. iv. 162.)

E. florida (florid). *fl.* terminal, umbellate, glabrous; corolla two lines long, urceolate. June, July. *l.* linear, pilose. *h.* 1ft. 1803. (L. B. C. 234.)

E. gemmifera (bud-bearing). *fl.* drooping, crowded, disposed in a verticillate crown; corolla orange-red, with a green apex, villous, cylindrical, inflated. July, August. *l.* oblong, adpressed, ciliated, aristate, four to five in a whorl. Branches thickened at top. *h.* 1ft. 1802. (B. M. 2266.)

E. gracilis (slender).* *fl.* small, terminal, spicate; corolla purplish-red, ovate-globose, or urceolate. September to December. *l.* glabrous, four in a whorl, linear. *h.* 1ft. 1774. (A. H. ii. 68.)

E. g. vernalis (spring).* *fl.* terminal; corolla purplish-red, campanulate. March, April. *l.* glabrous, acerose, three in a whorl. *h.* 2ft. to 3ft. 1827. (L. B. C. 1608.)

E. grandiflora (large-flowered).* *fl.* axillary near the tops of the branches and stem, verticillate; corolla bright glossy yellow, 1in. long, curved, trumpet-shaped, viscid, with a revolute limb. June, July. *l.* linear, bluntish, glabrous, reclinate, four to six in a whorl. *h.* 3ft. 1785. See Fig. 722. (A. H. iii. 117; B. M. 189.)

E. grandinosa (hail-stone). *fl.* terminal, drooping, by threes; corolla white, irregularly ovate, inflated, small. April, May. *l.* linear, three in a whorl. *h.* 6in. to 12in. 1810. (A. H. vi. 265.)

E. Hartnelli (Hartnell's). *fl.* large, terminal; corolla purple, viscid, nearly tubular, rather ventricose at the base, with ovate-triangular lobes. May. *l.* four in a whorl, lanceolate, imbricated, finely ciliated. *h.* 2ft. 1820.

E. herbacea (herbaceous). A synonym of *E. carnea*, in gardens generally applied only to the white-flowered variety of that species.

E. hybrida (hybrid).* *fl.* disposed in long, dense, spikes; corolla

Erica—*continued.*

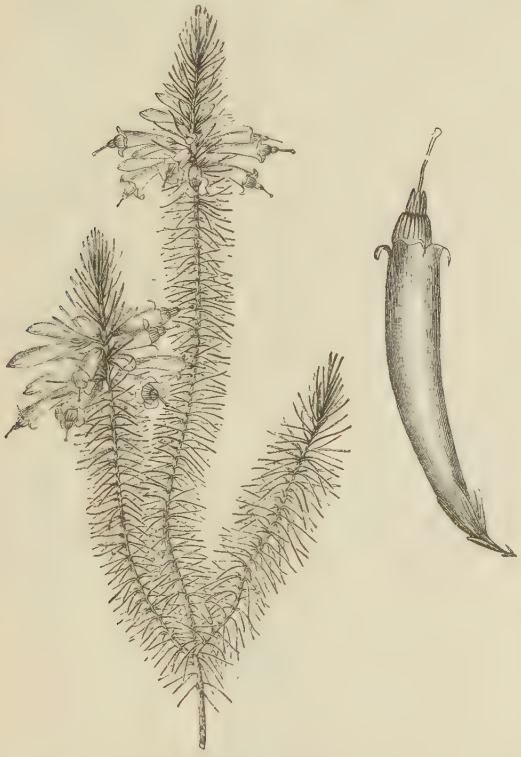


FIG. 722. ERICA GRANDIFLORA, showing Flowering Branch and detached Single Flower.

bright red, 1in. long. May, June. *l.* long, linear. **Hybrid.** SYN. *E. cylindrica.* See Fig. 723.

E. hyemalis (winter).* *fl.* disposed in long, dense, leafy spikes, 10in. to 12in. in length; corolla rosy-pink at the base, white towards the apex, campanulate. Winter, spring. *l.* linear, acuminated, hairy. *h.* 2ft. Hybrid.

E. inflata (inflated). *fl.* in terminal umbellate fascicles; corolla reddish-purple at the base, and green at the apex, large, with an elongated, ovate, ventricose tube, and a short limb. May to September. *l.* four in a whorl, linear, glabrous. *h.* 1ft. to 2ft. 1800.

E. infundibuliformis (funnel-shaped). *fl.* terminal, aggregate; corolla pale red, salver-shaped, with a slender tube and large segments. August to November. *l.* four in a whorl, filiform, obtuse, erect, glabrous. *h.* 2ft. 1802. (A. H. v. 218.)

E. Irbyana (Irby's).* *fl.* terminal, umbellate; corolla white, tinged with red, more than 1in. long, viscid, with a cylindrical ventricose tube, and large segments. June and July. *l.* three in a whorl, cuspidate, with scabrous margins, erect. *h.* 1ft. to 2ft. 1800. (A. H. v. 219.)

E. jasminiflora (Jasmine-flowered).* *fl.* terminal, aggregate; corolla about 1in. long, salver-shaped, viscid, with a reddish ovate tube, which is ventricose at the apex. June to November. *l.* three in a whorl, linear-oblong, serrulated, recurved, imbricated in six rows. *h.* 1ft. to 2ft. 1794. The variety *alba* has pure white flowers.

E. jubata (maned). *fl.*, pedicels terminal, corymbose, hispid; corolla campanulately rotate. June to October. *l.* linear, filiform, rather clammy, incurvedly spreading. *h.* 2ft. 1800.

E. Lambertiana (Lambert's).* *fl.* large, terminal, sub-corymbose, drooping; corolla white, glabrous, ovate-globose. May to July. *l.* three in a whorl, linear, glabrous, spreading. *h.* 1ft. to 2ft. 1800. (A. H. iv. 171.)

E. Linnæana (Linnæan).* *fl.* axillary, numerous, nearly sessile, horizontal; corolla white, with a red base, clavate, downy or villous. January to May. *l.* ciliated, spreading, acerose. *h.* 1½ft. 1790. (A. H. ii. 75.) The variety *superba* is a very handsome form, with large erect white flowers, tinged with red.

E. lutea (yellow). *fl.* nearly terminal; corolla yellow, two and a-half lines long, ovate, ventricose. September to May. *l.* opposite, linear, imbricate, glabrous. Branches flexuous. *h.* 1ft. 1774. (A. H. i. 29.)

E. mammosa (nippled). *fl.* drooping, axillary, crowded, verticillate, near the tops of the branches; corolla reddish-purple,

Erica—*continued.*

downy, eight to ten lines long, with a cylindrical inflated tube. July to October. *l.* linear, subulate, glabrous, erect, spreading. *h.* 2ft. 1769. (A. H. iii. 124.)

E. Marnockiana (Marnock's).* *fl.* glossy rich purple, tubular, inflated at the base, and narrow at the neck, with a small spreading limb; tube smooth. July, August. *l.* oblong, spreading, ciliated, awned. Hybrid.

E. Massonii (Masson's).* *fl.* axillary, crowded, drooping, disposed in a verticillate crown; corolla about 1in. long, viscid, swollen at top, with a scarlet tube and a greenish-yellow constricted mouth. July to October. *l.* four to five in a whorl, linear, serrulated, hairy, imbricated, spreading. *h.* 3ft. 1789. See Fig. 724. (A. H. iii. 128.)

E. McNabiana (McNab's).* *fl.* rosy-red, with a white limb; viscid, nearly 1½in. long, stoutest a little below the middle. May to July. *l.* short, thick, obtuse, awned, slightly spreading. Hybrid. (P. M. B. vii. 125.) The variety *rosea* has longer and more recurved leaves, and the flowers are bright rose in the tubes, veined with a deeper shade of the same colour, neck deep purple, and limb white.

E. mediterranea (Mediterranean). *fl.* axillary, racemose, secund, nodding; corolla red, with dark anthers, urceolate, one and a-half to two lines long. March to May. *l.* four or five in a whorl, linear-cuneated, glabrous. *h.* 4ft. to 6ft. Western Europe (Ireland). Hardy. (B. M. 471.)

E. melanthera (black-anthered).* *fl.* tinged with pink, with exserted black anthers. Autumn, winter. *l.* linear-obtuse, rather thick, glabrous, or slightly scabrid when young. *h.* 2ft. A compact-growing, floriferous species. (L. B. C. 867.)

E. metulæflora (ninepin-flowered). *fl.* terminal, umbellate; corolla red, with a pale border, salver-shaped, ventricose at the base. June to August. *l.* four to five in a whorl, linear, ciliated, spreadingly recurved. *h.* 1ft. to 2ft. 1798. (B. M. 612.)

FIG. 723. FLOWERING BRANCH OF ERICA HYBRIDA.

Erica—*continued.*

E. multiflora (many-flowered). *fl.* axillary, disposed in a racemose corymb; corolla pale red, with an urceolar or ovate bell-shaped tube, one and-a-half to two lines long; anthers black. October to February. *l.* four or five in a whorl, glabrous, linear. *h.* 2ft. France, 1731. Hardy. (Fl. Ment. 59.)

FIG. 724. FLOWERING BRANCH OF ERICA MASSONII.

E. mundula (neat). *fl.* terminal, usually in fours, sessile; corolla reddish-purple, salver-shaped, with a very short narrow tube, and a wide limb. October to February. *l.* four in a whorl, subulate, spreading, shining. *h.* 2ft. 1810. (A. H. vi. 273.)

E. mutabilis (changeable). *fl.* in terminal umbels; corolla tube bright red, ¾in. long, smooth. *l.* four in a whorl, linear-obtuse, hairy. *h.* 6in. 1798. (B. M. 2348.)

E. odorata (perfumed).* *fl.*, corolla white, campanulate, very fragrant. May to July. *l.* four in a whorl, glandularly ciliated. *h.* 1ft. 1829. (B. M. 1399.)

E. ovata (ovate). *fl.* terminal; corolla purplish-red, tubular, with a narrow throat, nearly 1½in. long, much inflated. May and June. *l.* three in a whorl, oblong, finely ciliated. *h.* 1ft. 1811. (L. B. C. 417.)

E. Parmentieriana (Parmentier's).* *fl.* terminal; corolla reddish-purple, with a cylindrically ventricose tube, and broad spreading segments. June to August. *l.* four in a whorl, linear, spreading. *h.* 1ft. 1810. (L. B. C. 197.) The variety *rosea* is a compact-growing form, with deep rosy-purple flowers, which are usually produced in fours from each lateral growth.

E. Paxtoniana (Paxton's). *fl.* in umbels of eight or ten; corolla shading to white, with a greenish-purple neck, tubular, stout, about 1in. long. *l.* linear-oblong, recurved, hairy. Hybrid.

E. persoluta (garland-flowered). *fl.* terminal; corolla small, campanulate, one and a-half lines long, with deep acute segments. April, May. *l.* four in a whorl, short, linear, glabrous. Branches downy or hairy. *h.* 1ft. 1774. (B. M. 342.) There are two varieties of this species: *alba* (flowers white), see Fig. 725; and *rosea* (flowers red).

E. perspicua (clear-flowered). *fl.* terminating the small branches, spike-formed; corolla reddish-purple, cylindrical, erect. April to June. *l.* linear, nearly smooth. *h.* 2ft. 1800. (A. H. v. 230.)

E. p. nana (dwarf).* *fl.*, corolla tube pinkish-white, 1in. long, slender; limb white. *l.* hairy.

E. physodes (puffed-out).* *fl.* terminal, four to six in a fascicle; corolla white, ovate-globose, clammy, three to four lines long. March to May. *l.* four to six in a whorl, spreading, viscid, slender. *h.* 1ft. to 2ft. 1788. (B. M. 443.)

Erica—*continued.*

E. primuloides (Cowslip-like).* *fl.* terminal, nearly sessile, fastigiate; corolla rosy-purple, with an ovate tube, and a broad spreading limb. May, June. *l.* five in a whorl, acerose. *h.* 1ft. 1802. SYN. *E. delecta.* (B. M. 1548.)

E. princeps (chief). *fl.* terminal, umbellate; corolla reddish-purple, viscid, with a ventricose tube, and a hairy top. May to July. *l.* four in a whorl, linear, ciliated, recurved. *h.* 1ft. to 2ft. 1800. (A. H. iii. 140.) The variety *carnea* has longer, flesh-coloured flowers, with a narrower tube.

E. propendens (propendent).* *fl.* terminal, solitary, or by threes; corolla purple or deep red, bell-shaped. July. *l.* four in a whorl, short, ciliated. Branches flexuous. *h.* 1ft. 1800. (B. M. 2140.) *E. p. tubiflora* is a handsome garden hybrid, with flowers rosy-purple at the base, and white in front; leaves clothed at the edges with white hairs.

E. pulverulenta (powdered). *fl.* terminal; corolla purplish-red, ovate. June to August. *l.* three in a whorl, acerose. Plant clothed with powdery down. *h.* 1ft. 1820. (P. M. B. xvi. 161.)

E. pyramidalis (pyramidal). *fl.* terminal, usually in threes; corolla purplish-red, funnel-shaped, with a spreading border, about four lines long. March. *l.* pubescent, spreading, acerose, six or more in a whorl. *h.* 1½ft. 1787. (A. H. iii. 142.)

E. ramentacea (scaly).* *fl.* terminal, umbellate; corolla purplish-red, with a spherical eight-angled tube, and a recurved erect limb. July to December. *l.* acerose, four in a whorl, glabrous. *h.* 1½ft. 1786. (A. H. iii. 143.)

E. regerminans (regerminating). *fl.* pedicellate, drooping, semi-lateral; corolla pale red, ovate-globular, small. May to August. *l.* linear, recurved, three in a whorl. *h.* 1½ft. 1791. (L. B. C. 1728.)

E. retorta (curled-back-leaved). *fl.* terminal, umbellate, usually seven or eight together; corolla pale red, viscid, with an ovate, ventricose tube, and acute segments, eight to nine lines long. June to August. *l.* four in a whorl, squarrosely recurved, and, as well as the calyces and bracts, fimbriately ciliated and

FIG. 725. FLOWERING BRANCH OF ERICA PERSOLUTA ALBA.

Erica—*continued.*

aristate. *h.* 1ft. 1781. (A. H. iii. 144.) *E. r. major* is a closer-growing form, with the corolla tubes stouter, pink, reddish-purple at the points, the lobes white. (B. M. 352.)

E. rubens (red). *fl.* terminal; corolla purplish-red, ovate-globose, small. July and August. *l.* acerose, four in a whorl, hispid, spreading. *h.* 1ft. 1798. (A. H. i. 43.)

FIG. 726. FLOWERING BRANCH OF ERICA RUBRO-CALYX.

E. rubro-calyx (red calyx).* *fl.* produced on the lateral growths, and disposed in dense spikes; corolla white, tubular; calyx reddish-purple. *l.* linear-lanceolate. Hybrid. See Fig. 726. (A. H. vi. 285.)

E. sanguinea (bloody). *fl.* terminal, corymbose; corolla blood-red, tubular, nearly 1in. long. *l.* linear, three in a whorl, with revolute ciliated margins. *h.* 1ft. to 2ft. 1799. (L. B. C. 86.)

E. Savileana (Savile's).* *fl.* red or purplish-red; peduncles loosely racemose, axillary; corolla globose-oblong. April to September. *l.* four in a whorl, linear, glabrous, erect. *h.* 1ft. 1800. (A. H. v. 238.)

E. scabriuscula (roughish). *fl.* produced from the points of all the shoots; corolla white, campanulate. April, May. *l.* bluntly oblong, clothed with rough glandular hairs, as are also the stems and branches. *h.* 1ft. 1805. (L. B. C. 517.)

E. scoparia (broom).* *fl.* greenish, in long, unilateral racemes; calyx lobes ovate, about one-half of corolla; corolla sub-globose, as broad as long; anthers without appendage. *l.* in scattered whorls of three each. Branches glabrous. *h.* 2ft. to 3ft. South Europe. Hardy. (Fl. Ment. 59.)

E. Sebana (Seba's). *fl.* terminal, in threes; corolla pale brown; tube cylindrical, incurved, ventricose at the base; stamens much exserted. April to November. *l.* three or four in a whorl, recurvedly spreading. *h.* 2ft. 1774. (L. B. C. 23.) The following are three varieties of this species: *fusca*, flowers rich dark brown; *lutea*, flowers rich yellow; *rubra*, flowers rich reddish-brown.

E. Shannoniana (Lady Shannon's).* *fl.* terminal, umbellate, drooping; calyx coloured; corolla white, tinged with purple, with a ventricose ribbed tube, 1½in. long. June to September. *l.* three or four in a whorl, stiff, linear-lanceolate, spreading, each ending in a hair. *h.* 1ft. to 2ft. 1805. (B. M. 4069.)

E. speciosa (showy). *fl.* terminal, in threes; corolla dark red or reddish-purple, having a cylindrical, inflexed, curved tube, with a greenish-yellow mouth. June to September. *l.* linear, downy, spreading. *h.* 2ft. 1800. (A. H. iv. 192.)

E. Spenceriana (Spencer's). *fl.* dull purplish-lilac, tubular, 1in. long, tipped with white. Spring and summer. *l.* subulate, slightly spreading, smooth. Hybrid.

Erica—*continued.*

E. splendens (splendid). *fl.* densely crowded, drooping; corolla deep red, downy, with a sub-revolute limb. April to September. *l.* linear, obtuse, spreading. *h.* 2ft. 1792. (A. H. v. 240.)

E. stricta (upright). *fl.* terminal, umbellate; corolla three lines long, with an ovate urceolar tube, and reflexed segments. August to November. *l.* four in a whorl, obtuse, glabrous, bisulcate beneath. *h.* 2ft. to 3ft. South-western Europe, 1765. (A. E. ii. 134.)

E. suaveolens (sweet-scented). *fl.* terminal; corolla pale red, urceolate; anthers a little exserted, black. August. *l.* three in a whorl, oblong-lanceolate, ciliated. *h.* 1ft. 1800. (A. H. vi. 232.)

E. sulphurea (sulphur-coloured). *fl.* fasciculate, axillary and terminal, nearly sessile, horizontal; corolla cylindrical, trumpet-shaped, villous. June to October. *l.* linear, obtuse, villous. *h.* 2ft. 1805. (A. H. v. 241.)

E. taxifolia (Yew-leaved). *fl.* in terminal clusters; corolla bright pink (as is also the calyx), globose, erect. May, June. *l.* three in a whorl, smooth, spreading. *h.* 1ft. 1783. (A. H. ii. 93.)

E. Tetralix. Cross-leaved Heath. *fl.* capitate, terminal; corolla pale red, three lines long, ovate-globose, downy at top, outside. July to September. *l.* ciliated, four in a whorl. *h.* 6in. to 12in. Plant of a greyish hue. Europe (Britain). Hardy. (Sy. En. B. 889.)

E. Thunbergii (Thunberg's). *fl.* sub-terminal, umbellate; corolla reddish-orange colour at top, and greenish-yellow at the base, with a globose tube and a large limb. February to August. *l.* three in a whorl, linear, glabrous, glaucous. *h.* 1ft. 1794. (B. M. 1214.)

E. transparens (transparent). *fl.* large, crowded at the tops of the branches on every side, somewhat spicate; corolla six to seven lines long, tubular, bristly towards the apex outside. May. *l.* ovate-cuneated, shortly pectinate. *h.* 1½ft. 1800. (A. H. vi. 295.)

E. tricolor (three-coloured).* *fl.* terminal, usually about six together; corolla red at the base, white at top, but greenish-yellow about the contraction of the limb; viscid, with a large ventricose tube, and ovate-cordate, slightly crenulated segments. May to July. *l.* three in a whorl, linear, recurved, ciliated, as are also the bracts and calyces. *h.* 2ft. 1810. (P. M. B. vi. 3.)

FIG. 727. ERICA VESTITA COCCINEA, showing Flowering Branch and detached Single Flower.

E. t. flammea (flame). *fl.* about 1½in. long. *l.* bluntly-oblong, slightly recurved, awned; edges clothed with a profusion of hoary hairs.

E. t. inflata (inflated). *fl.* about 1in. long. *l.* erect, slightly spreading. Stems and branches densely clothed with hairy leaves.

Erica—*continued.*

E. t. rubra (red).* *fl.* about 1in. long, reddish-purple, shading off to white, with a green neck. *l.* closely set, slightly spreading, hairy.

E. t. speciosa (showy). *fl.* 1in. long, umbellate, slightly swollen below the rosy-red middle. *l.* linear-lanceolate, slightly spreading.

E. t. Wilsoni (Wilson's).* *fl.* 1½in. long, much inflated at the base, suddenly contracted at the neck. *l.* oblong-lanceolate, slightly spreading, profusely hairy.

E. triumphans (triumphant). *fl.* white, axillary; calyx large, inflated, angular; corolla ovate, inflated. June, July. *l.* three in a whorl, subulate, ciliated. *h.* 2ft. 1802. (L. B. C. 257.)

E. trossula (Spruce). *fl.* terminal; corolla with an open ventricose tube. May to July. *l.* four in a whorl, linear, glabrous. *h.* 1½ft. 1806.

E. vagans (wandering).* Cornish Heath. *fl.* axillary, racemose; corolla pale purplish-red, short, campanulate; pedicels usually twin. July to September. *l.* four or five in a whorl, acerose. *h.* 1ft. Western Europe (Cornwall). Hardy. (Sy. En. B. 893.)

E. ventricosa (ventricose). *fl.* disposed in terminal umbellate fascicles; corolla purplish-red, with a ventricose tube, waxy; style inclosed. April to September. *l.* four in a whorl, short, acerose, semi-cylindrical, and, as well as the calyces and bracts, ciliated. *h.* 1½ft. 1787. (B. M. 350.) Of this very handsome, compact, and free-branching Heath, there are numerous varieties.

E. v. alba (white). *fl.* china white, tubular, about 1in. long. *l.* with short white woolly hairs at the edges.

E. v. breviflora (short-flowered). *fl.* rosy-red, short, stout, thickest at the base.

E. v. carnea (flesh-coloured). *fl.* flesh-colour, 1in. long, slightly swollen at the base.

E. v. coccinea minor (lesser scarlet).* *fl.* white, slender, tubular; tubes ⅔in. long; lobes of limb reflexed and bright red. (R. H. 1880, 50.)

E. v. fasciculata rosea (rosy-fascicled). *fl.* stout, 1in. long; tube bright rose, deep purple at the neck.

E. v. grandiflora (large-flowered).* *fl.* rosy-purple, stout, tubular, over 1in. in length. *l.* long, straight.

E. v. splendens (splendid). *fl.* numerous, nearly 1in. long, swollen in the middle; tubes white; neck and limb rosy-purple and white. *l.* long, linear, recurved, hairy.

E. v. tricolor (three-coloured).* *fl.* tubular, nearly 1in. long; tubes blush; neck carmine, reflexed; segments of limb white. *l.* linear, slightly reflexed.

E. verticillata (verticillate). *fl.* crowded, nearly terminal, verticillate, drooping; corolla scarlet, with a cylindrical inflated tube, glabrous, constricted at top. July to October. *l.* linear, glabrous. *h.* 3ft. 1774. (A. H. i. 48.)

E. vestita (clad).* *fl.* crowded, verticillate, nearly sessile, spreading; corolla white, cylindrical, more or less clavate, nine to eleven lines long, downy, with a revolute limb; calycine segments ciliated with glandular hairs. *l.* linear, erect, with scabrous edges. *h.* 3ft. 1789. The following are the more important forms:

E. v. alba (white).* *fl.* hardly 1in. in length, pure white; whorls ten to twenty-flowered. (A. H. iii. 147.)

E. v. coccinea (scarlet).* *fl.* deep rich red, about 1in. long, tubular, slightly curved. See Fig. 727. (A. H. iv. 199.)

E. v. incarnata (flesh-coloured). *fl.* delicate pink, more than 1in. long, in whorls of from ten to twenty. (A. H. ii. 97.)

E. v. rosea (rosy). *fl.* rosy-red, about 1in. long, in whorls of from twenty to thirty.

E. Victoria (Victoria).* *fl.* deep purple, with white segments, umbellate, flask-shaped, 1in. or more long. Summer. *l.* somewhat ovate, awned, with short stiff spines round the edges. Hybrid.

E. Westphalingia (Westphalian).* *fl.* rosy-red, tubular, 1in. long. Summer. *l.* linear-obtuse. Hybrid.

E. Wilmoreana (Wilmore's).* *fl.* produced upon the lateral growths, in spikes of from 1ft. to 1½ft. long; corolla bell-shaped, nearly ⅔in. long. Spring. *l.* linear, covered with short white hairs, as are also the branches. Hybrid.

ERICACEÆ. An extensive order, widely spread over the whole world (but very rare in Australia), containing eighty-seven genera and about 1300 species. The species are, for the most part, shrubs or sub-shrubs, but occasionally growing into small trees. Flowers regular, or nearly so, hermaphrodite; calyx superior or inferior, of four or five divisions; corolla four or five-cleft, or toothed; stamens four, five, eight, or ten, or twice those numbers, hypogynous or epigynous. Fruit a capsule or berry. Leaves mostly evergreen, whorled, alternate or opposite, exstipulate. Well-known genera are: *Arbutus*, *Cassandra*, *Erica*, *Gaultheria*, *Pieris*, *Pyrola*, and *Rhododendron*.

ERICINELLA (a diminutive of *Erica*). ORD. *Ericaceæ*. A genus of four species of small-flowered, slender, bushy, erect, greenhouse evergreen shrubs, with a Heath-like appearance. They are natives of South Africa and the mountains of tropical Africa and Madagascar. Probably none have ever been introduced, except the following. For cultivation, *see* **Erica.**

E. Mannii (Mann's). *fl.* dull red, three or four together at the tops of the branchlets, on short, curved pedicels, nearly globose; corolla sub-globose, with four short, obtuse, ciliate lobes. July. *l.* quaternate, close-set, whorled in fours, linear, with revolute margins, glabrous. *h.* 4ft. to 10ft. Cameroon Mountains, 1866. (B. M. 5569.)

ERIGERON (from *Eriogron* (early old), the name given to a Composite by Theophrastus; species downy-hoary when young). Including *Phalacroloma* and *Polyactidium*. ORD. *Compositæ*. A genus comprising about a hundred species of hardy annuals, biennials, or perennials, resembling *Aster*, but having the ray-florets in several series. In Britain, it is represented by the perennial *E. alpinus*, a pretty rock plant found in the Breadalbane and Clova Mountains; the annual or biennial *E. acris*; and the annual *E. canadense*, a troublesome weed in some places. They are found everywhere in cold and mountainous regions, and are of very easy culture in common garden soil. Few species are worth growing. Those enumerated below form excellent subjects for mixed borders, in a somewhat moist, but well-drained situation. They may be readily increased by divisions or by seeds.

E. aurantiacus (golden).* *fl.-heads* about 2in. across, bright orange, solitary, on a stout, erect peduncle. *l.* oblong, entire; upper ones sessile, lanceolate. *h.* 1ft. Turkestan, 1879. Perennial. (Gn., Sept. 20, 1884.)

E. caucasicus (Caucasian). *fl.-heads* scarcely 1in. across, rosy-purple, borne in loose masses on stems nearly 2ft. high. Summer. *l.*, radical ones spathulate; cauline ones ligulate, stem-clasping. *h.* 1ft. Caucasus, 1821. Perennial.

E. glabellus (smooth-leaved). *fl.-heads* large, one to seven on the leafless summit of the stout stems; ray-florets very numerous, purple; disk yellow. June. *l.* nearly glabrous, except the margins, entire; the upper oblong-lanceolate and pointed, closely sessile or partly clasping; the lower spathulate, stalked. *h.* 6in. to 18in. North United States. Perennial.

FIG. 728. ERIGERON GLAUCUS.

E. glaucus (glaucous).* *fl.-heads* purple, pretty. Summer and autumn. *l.* ciliated, glaucous, clammy; radical ones with winged stalks; cauline ones sessile, entire. *h.* 6in. to 12in. Western North America, 1812. Perennial. See Fig. 728. (B. R. 10.)

E. grandiflorus (large-flowered).* *fl.-heads* purple or whitish, comparatively large, solitary. Late summer. *l.*, radical ones obovate-spathulate; cauline ones oblong to lanceolate. *h.* 4in. to 8in. Rocky Mountains, 1819. Perennial.

E. multiradiatus (many-rayed).* *fl.-heads* terminal, solitary, about 2in. across, surrounded by numerous overlapping linear leaves; ray-florets purplish; disk yellow. Summer. *l.* oblong, toothed, tapering into a long stalk. *h.* 6in. to 2ft. Himalaya, 1880. (B. M. 6530.)

E. Roylei (Royle's).* *fl.-heads* 2in. across, disposed in a loose corymb; ray-florets bluish-purple; disk yellow. Summer. *l.* oblong-spathulate, smooth, ciliated. *h.* 4in. to 8in. Himalayas.

E. speciosus (showy).* *fl.-heads* large, handsome, corymbose; ray-florets violet, exceedingly narrow; those of the disk

Erigeron—*continued.*

yellow; peduncles single-flowered; involucre hemispherical. Summer and autumn. *l.* sessile, oblong, acute, entire, ciliated at the margin, the rest glabrous, dark green, marked with nerves, which commence near the base and run upwards, nearly parallel with the midrib; radical ones spathulate, tapering into long slender stalks. Stem herbaceous, 1½ft. high, rounded, striated, glabrous, erect, and branched upwards in a corymbose manner. Western North America. Perennial. (B. M. 3606, and B. R. 1577, under name of *Stenactis speciosa.*)

ERINOSMA. *See* **Leucoium.**

ERINUS (*Erinos*, a plant mentioned by Dioscorides). Ord. *Scrophularineæ.* A very pretty tufted alpine plant, suitable for growing (in dwarf positions) on well-drained rockwork, amongst stony or gritty peat and loam, or on brick walls, in which situations it is easily established by sowing the seed in earthy holes and crevices. When the plants are developed, the seeds become self-sown, and the produce from these withstand the winter best. It may also be propagated by division.

E. alpinus (alpine).* *fl.* purple, alternate; racemes simple, terminal, sub-corymbose. March to June. *l.* tufted, spathulate, deeply serrated, hairy. *h.* 5in. to 6in. Mountains of Western Europe (naturalised here and there in Britain), 1739. (B. M. 310.) There is also a white-flowered variety.

ERIOBOTRYA. Included under **Photinia** (which *see*).

ERIOCALIA MAJOR. *See* **Actinotus Helianthi.**

ERIOCAULON (from *erion*, wool, and *kaulos*, a stem; alluding to the woolly scapes of some species). Pipewort. Syns. *Randalia, Sphærochloa, Symphachne.* Ord. *Eriocauloneæ.* A genus of about a hundred species of widely distributed aquatic or marsh plants. None are in cultivation except in botanic gardens. The only European representative of the genus is *E. septangulare*, an inconspicuous plant, which, in the Old World, is only found in lakes in Skye and the West of Ireland.

ERIOCAULONEÆ. A natural order of marsh plants, having minute flowers and principally radical leaves. They are, for the most part, natives of South America. The typical genus is *Eriocaulon.* There are six genera and 325 species.

ERIOCHILUS (from *erion*, wool, and *cheilos*, a lip; referring to the disk of the labellum or lip being pubescent). Ord. *Orchideæ.* A genus of five species of pretty greenhouse terrestrial Orchids, from Australia. They thrive in a compost of light turfy loam, peat, and sand, in equal proportions, and may be increased by division of the roots.

E. autumnalis (autumnal). *fl.* pink, solitary, or two or three rather distant; labellum about half as long as the lateral sepals, with an erect, concave, narrow claw. October. *l.* radical, ovate, acute, usually dying away before the time of flowering. *h.* 6in. 1823. A slender plant. Syn. *Epipactis cucullata.* (H. F. T. 120.)

E. dilatatus (dilated). *fl.* resembling those of *E. autumnalis*, one or two, rarely three; lip much shorter, the claw erect, with slightly prominent rounded lateral lobes. May. *l.* linear-lanceolate, sessile, and stem-clasping. *h.* 6in. to 12in. There are one or two varieties of this species.

E. multiflorus (many-flowered). This closely resembles *E. dilatatus*, of which it is probably only a variety. The habit and foliage are the same, but the flowers are more numerous and rather smaller. March.

E. scaber (rough). *fl.* pink one to three; sepals and petals rather shorter and broader than in *E. autumnalis*, but otherwise with the same proportions; labellum claw distinctly produced into small, erect, rounded lateral lobes. September. *l.* radical, ovate or cordate, usually persisting at the base of the flowering stem. Closely allied to *E. autumnalis.*

ERIOCNEMA (from *erion*, wool, and *kneme*, a leg; alluding to the hairy stalks). Ord. *Melastomaceæ.* A genus containing a couple of species of stove herbaceous plants, natives of South Brazil. Flowers white, small, few, in umbels at the end of a naked stalk. Leaves oval, heart-shaped at the base, and clothed with rusty hairs. For culture, *see* **Bertolonia.**

E. fulvum (reddish-yellow). *fl.* pink. June. *h.* 6in. 1850.

Eriocnema—*continued.*

E. marmoratum (marbled). *fl.* rose. May. *l.* beautifully variegated. *h.* 4in. 1850. (L. & P. F. G. i. 27.)

ERIOCOMA. *See* **Montanoa.**

ERIODENDRON (from *erion*, wool, and *dendron*, a tree; alluding to the capsule being filled with a fine woolly substance). Ord. *Malvaceæ.* A genus of about eight species of very fine stove evergreen trees, with spongy wood. One species is found in the Old World; the rest are tropical American. Flowers large, singly or in clusters from the sides or tops of the branches. Leaves palmate. They thrive best in a rich loamy soil; and should be raised from seeds, sown in a sandy soil, in heat.

E. anfractuosum (curled). *fl.* clothed with silky wool on the outside and yellowish on the inside. *l.*, leaflets five, seven, or eight, entire, or serrulated above, lanceolate, cuspidate. Trunk usually prickly. *h.* 100ft. West Indies, 1739.

E. a. Caribæum (Caribean). *fl.* conspicuous, handsome, and with a delightful, but evanescent fragrance, either solitary or two or three together in a short kind of panicle, for the most part axillary towards the ends of the branches; petals five, of a pale primrose or cream colour, with the part a little above their base of a deep purplish-red, spreading in streaks towards their middle. *l.* palmate, deciduous; leaflets from five to seven, oblong-lanceolate, acuminate, smooth and shining above, opaque and paler, with a faint bluish tinge beneath; midrib yellow, prominent. West Indies. Plant smooth, except the flower. An extremely elegant, but at the same time curious-looking, high tree. (B. M. 3360.)

E. leiantherum (smooth-flowered). *fl.* white, sub-terminal and lateral at the tops of the branches, large, woolly on the outside. *l.*, leaflets five to seven, ovate, cuspidate, quite entire. *h.* 70ft. Brazil, 1818.

ERIOGONUM (from *erion*, wool, and *gonu*, a joint; joints of the stems downy). Ord. *Polygonaceæ.* A genus of rather pretty summer-flowering hardy annuals and herbaceous or somewhat woody perennials. There are about 100 species, natives of North-western America. Flowers perfect, involucrate; stamens nine, upon the base of the perianth. Leaves radical, alternate or verticillate, entire, without stipules. They thrive in a loamy-peat soil, and may be increased by division or seed.

E. compositum (compound). *fl.* dull white or rose-coloured; *l.* stalked, densely tomentose beneath, greener above, oblong-ovate, cordate at base; peduncles erect, stout, 6in. to 18in. high, nearly glabrous. Perennial. (B. R. 1774.)

E. corymbosum (corymbose). *fl.* white to deep rose, rarely yellow. *l.* ovate to oblong-lanceolate; umbel stiff, broadly cymose; involucres mostly sessile. *h.* 1ft. Perennial.

E. stellatum (starred). *fl.* yellow, frequently in loose compound umbels. *l.* two or three, arising from the scape, exactly resembling those of *Statice oleifolia*, slightly downy, and only so beneath. *h.* 6in. to 12in. Interior of North-west America. (H. F. B. A. ii. 177.)

E. umbellatum (umbellate). *fl.* yellow. *l.* obovate to oblong-spathulate or oblanceolate, more or less tomentose, especially beneath. *h.* 3in. to 12in.

ERIOPHORUM (from *erion*, wool, and *phoreo*, to bear; heads cottony). Cotton Grass. Including *Trichophorum.* Ord. *Cyperaceæ.* A genus (confined to North temperate and Arctic regions) of about a dozen species of pretty bog plants, closely allied to *Scirpus*, but differing from it in that the hypogynous bristles, as the flowering advances, protrude to a great length beyond the spikelets, forming silky-cottony tufts, whence the common name. They can be naturalised with great success by the margins of ponds, &c., or in the boggy spots of the wild garden.

E. alpinum (alpine). This plant resembles *Scirpus cæspitosus*, with the exception of having long bristles. Northern hemisphere (probably now extinct in Britain).

E. vaginatum (sheathed). *fl.*, spikelet solitary, terminal, ovoid, six to eight lines long, deep olive-green; hypogynous bristles numerous to each flower, forming cottony tufts, nearly globular. Stems tufted, 1ft. high, or more, covered at the base with a few loose ragged sheaths, one of which bears linear, almost subulate leaves. Northern hemisphere (Britain, but especially abundant in Scotland and Ireland).

ERIOPHYLLUM (from *erion*, wool, and *phyllon*, a leaf; woolly-leaved). Ord. *Compositæ.* A genus of about a dozen species of mostly floccose herbs, rarely

Eriophyllum—*continued.*

suffruticose (from Western North America), merged into *Bahia* by Bentham and Hooker.

E. cæspitosum (B. R. 1137), perhaps the only species in cultivation, is identical with **Bahia lanata** (which *see*) and *Actinella lanata.*

ERIOPSIS (from *Eria*, and *opsis*, like; resemblance). ORD. *Orchideæ*. A genus of three or four species of very ornamental cool-house epiphytal Orchids, natives of Northern Brazil, Guiana, and Columbia. A copious supply of water when growing, full exposure to the sun, and a compost of fresh peat and living sphagnum, are essential. They require the temperature of an intermediate house, such as suits Cattleyas, &c. Increased by dividing the pseudo-bulbs.

E. biloba (two-lobed). *fl.* about 1in. across; sepals and petals oblong, dark yellow, shaded round their margins with brown; lip three-lobed, white, spotted with dark brown; spike 1ft. to 1½ft. long, curved or drooping. *l.* broad-lanceolate, borne in twos or threes at the apices of the pseudo-bulbs. Pseudo-bulbs 5in. to 8in. high, conical, dark brown. Native country unknown. 1845.

E. rutidobulbon (rough-bulbed). A species similar to *E. biloba*, but with larger and more deeply-coloured flowers. New Grenada, 1847. (B. M. 4437.)

ERIOSEMA (from *erion*, wool, and *sema*, a standard; vexillum clothed with silky hairs). ORD. *Leguminosæ*. A genus of about forty species of stove herbaceous plants and shrubs, most abundant in South America and tropical and South Africa. One species has a wide range in Asia and Australia. Flowers yellow or violet; racemes or fascicles axillary. Leaves digitately trifoliolate. The two best species are described below. They thrive in a compost of peat and loam. Propagated by seeds or cuttings.

E. grandiflorum (large-flowered). *fl.*, racemes terminal and axillary, panicled; corollas covered with soft pubescence on both surfaces. October. *l.*, leaflets oblong-elliptic, mucronate; petioles very short, and, as well as the nerves and veins on the under surface of the leaves, clothed with silky rufous down. Branches angular. *h.* 1ft. to 2ft. North Mexico.

E. violaceum (violaceous). *fl.* violaceous; racemes axillary and terminal, many-flowered. July and August. *l.*, leaflets three, oblong-linear, acute, greenish above and velvety, but clothed with rusty hairs beneath. *h.* 4ft. Tropical South America and Trinidad, 1820.

ERIOSPERMUM (from *erion*, wool, and *sperma*, seed; referring to the woolly envelope of the seeds). ORD. *Liliaceæ*. A genus of about twenty-five species of pretty greenhouse bulbous plants, from tropical and Southern Africa. For culture, *see* **Bulbine.**

E. Bellendeni (Bellenden's). *fl.* light blue. June to August. *l.* roundish, acuminate, cucullate at base. *h.* 1ft. Cape of Good Hope, 1800. (B. M. 1382, under name of *E. latifolium.*)

E. Mackenii (McKen's). *fl.* bright golden-yellow, jointed on the pedicel; scapes slender, cylindric, glabrous. July. *l.* ovate-oblong, obtuse, or sub-acute, quite glabrous, rather fleshy, smooth, nerveless. Natal, 1871. (B. M. 5955, under name of *Bulbine Mackenii.*)

E. proliferum (proliferous). *fl.* white, green. June to August. *l.* proliferous; leaflets filiform, undivided, sessile. *h.* 9in. Cape of Good Hope, 1821.

E. pubescens (downy). *fl.* white, green. June. *l.* sub-cordate, acute, cucullate, pubescent. *h.* 1ft. Cape of Good Hope, 1820. (B. R. 578.)

ERIOSTEMON (from *erion*, wool, and *stemon*, a stamen; stamens woolly). ORD. *Rutaceæ*. A genus of very handsome greenhouse evergreen shrubs. There are about thirty species, all (with the exception of a single species from New Caledonia) natives of extra-tropical Australia. Peduncles axillary, one-flowered, covered with imbricate bracts, or furnished with opposite or whorled ones in the middle. Leaves alternate, entire, simple, full of pellucid dots. Eriostemons are among the most useful and beautiful of Australian hard-wooded plants whose flowering season is winter and early spring. All the species are well worth attention, the flowers being freely produced when the plants are healthy and well ripened. They are either white or pale pink, and last a long time in good condition, if kept in a cool temperature. Propagation may be effected by cuttings, inserted in sandy peat, early in spring, covered with a bell glass,

Eriostemon—*continued.*

and placed in a gentle heat. When rooted, they should be hardened and potted off singly, to be transferred to larger sizes afterwards very gradually. The mode of propagation adopted by nurserymen on a large scale, is that of grafting, using for the purpose small stocks of *Correa*. This is a quick, and, as practised by them, a tolerably certain method. It is best for small growers to purchase such plants, as, by good culture, they soon form fine decorative subjects. Fibry peat, not broken too finely, with the addition of a little loam and silver sand, is a suitable compost. The soil should be rammed tolerably firm, care being taken not to bury the stem of the plant. Eriostemons succeed under the same treatment during the summer as many other Australian plants, namely, keeping a little close while the growth is being made, afterwards admitting more air, and finally placing outside, in a sunny position, from July until the end of September, in order to insure thorough ripening. The plants naturally form bush specimens, but may be trained as pyramids if desired. But little pruning, beyond shortening a few of the long growths, to induce a symmetrical habit, is necessary. In the case of large plants, whose flowers are used for cutting—a purpose for which they are well adapted—sufficient pruning may be performed simply by the removal of the longest flowering shoots. Efficient drainage and careful watering are at all times essential points towards success in cultivation. Eriostemons will flower earlier in winter if introduced into a temperature of about 55deg., but are quite as healthy and floriferous later on, if kept in a house from which frost is merely excluded. If old plants get out of health, it is advisable to prune back hard in spring, reduce the balls, and place them amongst new soil, in pots of a smaller size.

E. buxifolius (Box-leaved).* *fl.* pink or rose-coloured, axillary, almost sessile. April to June. *l.* small, cordate-ovate, or obovate, usually mucronate, with prominent glands. Branches round, pubescent. *h.* 1ft. to 2ft. 1822. (B. M. 4101.)

E. intermedius (intermediate).* *fl.* white, suffused with rosy-pink, large, solitary, axillary. April. *l.* obovate. *h.* 3ft. (B. M. 4439.)

E. myoporoides (Myoporum-like).* *fl.* rose-coloured; peduncles axillary, trifid, three-flowered. Early spring. *l.* linear-lanceolate, quite entire, smooth, glandular, mucronate. *h.* 1ft. to 2ft. 18-4. (B. M. 3180.)

E. neriifolius (Nerium-leaved).* *fl.* rose-coloured or pink; peduncles axillary, three-flowered. April. *l.* lanceolate, rather wrinkled, mucronate. *h.* 3ft. 1847.

E. salicifolius (Willow-leaved). *fl.* pink, axillary, almost sessile, solitary. July. *l.* linear-lanceolate, entire, smooth. Branches triquetrous. *h.* 2ft. to 3ft. 1822. (B. M. 2854.)

E. scaber (rough).* *fl.* white, tinged with pink, rather small; peduncles short. March to June. *l.* linear, entire, dark green, mucronate, glandular. *h.* 1½ft. 1840. (P. M. B. xiii. 127.)

ERIOSTOMUM. A synonym of **Stachys.**

ERIPHIA. *See* **Besleria.**

ERITHALIS (from *Erithales*, a plant mentioned by Pliny; the Greek word means very luxuriant). ORD. *Rubiaceæ*. A genus of about five species of stove evergreen shrubs, natives of Florida and the West Indian Islands. They thrive in sandy fibrous loam, to which a little peat may be added. Cuttings of ripened side shoots will root in sandy soil, during the spring or summer, if placed under a hand glass, in heat.

E. fruticosa (shrubby). *fl.* white, small, sweet-scented; peduncles axillary, panicled. July. *l.* petiolate, obovate, or spathulate-lanceolate; stipules broad, short, mucronate, sheathing, permanent. *h.* 10ft. to 15ft. Jamaica, 1793.

ERITRICHIUM (from *erion*, wool, and *thrix*, *trichos*, hair; plants woolly). ORD. *Boragineæ*. A rather large genus of handsome dwarf annual or perennial herbaceous plants, widely dispersed throughout the temperate regions of the Northern hemisphere; a few come from South Africa and Australia. The species here given is the one most generally known. Like many other beautiful plants which grow at considerable elevations, it is difficult to keep alive long; it requires a thoroughly well-drained

Eritrichium—*continued.*

spot on the rockery, where it would alway be moist. Increased by seeds, or by divisions.

E. nanum (dwarf). *fl.* brilliant sky-blue, with a yellowish eye, not unlike those of *Myosotis alpestris*, but larger. Summer. *l.* linear-obovate, covered with long silky-white hairs. *h.* 2in. to 3in. Alps, 1869. It has been enthusiastically termed the Glory of the Alpine Flora. (B. M. 5853.)

ERNODEA MONTANA. A synonym of *Putoria calabrica.*

ERODIUM (from *erodios*, a heron; the carpels resembling the head and beak of that bird). Heron's Bill. ORD. *Geraniaceæ.* A genus of about fifty species of pretty hardy or half-hardy herbs or sub-shrubs, natives of Europe (Britain), North Africa, and temperate Asia (rare in South Africa and Australia). Peduncles generally many-flowered. Leaves various in form. Every part of the plant, when bruised, emits a strong peculiar odour. Erodiums form admirable subjects for rockwork, in dry, sunny situations, and in a sandy soil. Increased by divisions, or by seeds.

E. alpinum (alpine). *fl.* purple, about 1in. across, six to ten in an umbel; petals obtuse, larger than the long-pointed sepals. May. *l.* smoothish, bipinnatifid. Stem branched. *h.* 1ft. Mountains of Southern Italy, 1814. Hardy.

E. caruifolium (Carum-leaved). *fl.* red, about ½in. across, eight to ten in an umbel. Spring. *l.* alternately pinnate; leaflets deeply bipinnate; midrib of under surface with soft white hairs. *h.* 6in. to 10in. Mountains of Central Spain. Hardy.

E. glandulosum (glandular).* A synonym of *E. macradenum.*

E. hymenodes (Hymen-like). *fl.* pink; upper petals with a reddish-brown spot at the base; peduncles many-flowered. Spring and summer. *l.* somewhat three-lobed, or three-parted, very blunt, deeply toothed. Branches clothed with long, soft hairs. Stem erect, branched, shrubby at the base. *h.* 1ft. Mount Atlas, 1789. Half-hardy. SYN. *E. trilobatum.* (B. M. 1174.)

E. macradenum (large-glanded).* *fl.* pale violet; petals acute, the two broadest ones dark purple at the base; peduncles many-flowered. June and July. *l.* clothed with glandular pubescence, pinnate, with bipinnatifid segments and lanceolate-linear lobes. Plant stemless. *h.* 6in. Pyrenees, 1798. Hardy. SYN. *E. glandulosum.* (B. M. 5665; Gn., Aug. 30, 1884.)

E. Manescavi (Manescaut's).* *fl.* purplish-red, disposed in umbels. Summer. *l.* pinnate; leaflets oblong, deeply cut, lower ones the largest. *h.* 1ft. to 2ft. Pyrenees. Hardy.

E. pelargoniiflorum (Pelargonium-flowered).* *fl.* white, spotted with purple; peduncles umbellate, eight to ten-flowered. Summer. *l.* radical, petiolate, ovate-cordate. Stem elongated, branched, ascending. Anatolia. Hardy. (B. M. 5206.)

E. petræum (rock). *fl.* purple; petals retuse; peduncles many-flowered. June. *l.* smoothish, pinnate, with pinnatifid segments and lanceolate-linear lobes. Plant stemless. *h.* 3in. to 6in. South France and Spain, 1640. Hardy.

E. Reichardi (Reichard's).* *fl.* white, faintly veined with pink; peduncles one-flowered. April to September. *l.* small, cordate, crenated, obtuse, smoothish. *h.* 2in. to 3in., forming a dense tuft. Majorca, 1783. Half-hardy.

E. romanum (Roman). *fl.* purplish; petals equal, longer than the sepals; peduncles many-flowered. Spring. *l.* pinnate; leaflets ovate, deeply cut. *h.* 6in. to 9in. South Europe, 1724. Hardy biennial. (B. M. 377.)

E. trichomanefolium (Trichomanes-leaved). *fl.* flesh-coloured, with darker lines; petals blunt, a little longer than the sepals; peduncles four-flowered. Summer. *l.* hairy, rather glandular, bipinnate, with oblong-linear lobules. Plant stemless. *h.* 4in. to 6in. Mount Lebanon. Hardy.

E. trilobatum (three-lobed). A synonym of *E. hymenodes.*

EROSE. Gnawed, bitten. A term used to denote a particular kind of irregular denticulation.

EROTEUM. *See* **Freziera.**

ERPETION. *See* **Viola.**

ERVUM. This genus is now merged, by the authors of the "Genera Plantarum," into **Vicia** (which *see*).

ERYNGIUM (from *eringion*, the old Greek name used by Theophrastus, &c.). Eryngo. ORD. *Umbelliferæ.* A genus of hardy or nearly hardy herbs, usually perennial and spiny. It comprises more than a hundred species, natives of temperate and sub-tropical regions, the majority being South American. Flowers congregated into oblong or roundish dense heads; lower bracts usually the largest, and forming an involucre round the

Eryngium—*continued.*

head of flowers. Radical leaves, as well as the cauline ones, sheathing more or less at the base. Many species of this genus are very handsome plants, and are well suited for growing in borders and in sub-tropical gardens. They thrive best in a light sandy soil. Increased by carefully-made divisions, or by seed.

E. alpinum (alpine).* *fl.* in oblong heads; involucre, along with the upper part of the herb and the flowers, of a beautiful blue colour. July and August. *l.*, radical and lower cauline ones on long petioles, deeply cordate, serrate-toothed; upper cauline ones palmately lobed, ciliately serrated; leaves of the involucre ten to twenty, rather soft, a little longer than the head of flowers. *h.* 1½ft. to 2ft. Europe, 1597. Hardy. (B. M. 922.)

E. amethystinum (amethyst-coloured).* *fl.* amethyst colour, in globose heads. July and August. *l.*, radical ones pinnatifid; lobes cut, spiny, somewhat pinnatifid. Stems smoothish, corymbosely branched at the apex; leaves of the involucre seven to eight, lanceolate, furnished with a few teeth at the base, much exceeding in length the head of flowers. *h.* 1ft. to 2ft. Europe, 1648. Hardy.

E. aquaticum (aquatic). *fl.* white or very pale blue, in globose heads. July to September. *l.* broadly linear, with parallel nerves, remotely spinosely-ciliate; lower leaves rather ensiform; upper ones lanceolate, toothed; leaves of the involucre eight to nine, shorter than the heads of flowers. *h.* 2ft. to 3ft. North America, 1699. Hardy. SYN. *E. yuccæfolium.* (B. R. 372.)

E. Bourgati (Bourgat's).* *fl.* bluish, in ovate heads. June to August. *l.*, radical ones orbicular, tripartite; lobes pinnatifid or cut in a forked manner, quite entire between the divisions; leaves of involucre ten to twelve, lanceolate, pungent, erect, much longer than the head of flowers. Stems simple, a little branched at the apex. *h.* 1ft. to 2ft. Pyrenees, 1731. Hardy.

E. bromeliæfolium (Pineapple-leaved). *fl.* white, in round heads. July. *l.* with parallel nerves, bearing large subulate teeth, which are shorter than the breadth of the leaves; radical ones very long, broadly lanceolate-linear; involucral leaves ten, lanceolate, exceeding the head of flowers. *h.* 3ft. to 4ft. Mexico. Half-hardy.

E. campestre (field). *fl.* blue, in roundish heads. July and August. *l.*, radical ones nearly ternate; segments pinnatifid; lobes ovate; cauline ones auriculated; leaves of involucre linear-lanceolate, exceeding the heads of flowers. Stem panicled. *h.* 1ft. to 2ft. Europe, &c. (Britain). (Sy. En. B. 570.)

E. dichotomum (spreading). *fl.* blue, in globose heads. July and August. *l.*, radical ones petiolate, oblong, cordate at the base, toothed; cauline ones palmately parted, spreading; lobes spiny-toothed; leaves of involucre lanceolate, much longer than the heads of flowers. *h.* 1ft. to 2ft. South Europe, &c., 1820. Hardy. *E. Lasseauxii* (R. H. 1874, 375) is closely allied to *E. dichotomum*, but the panicle of reddish-purple flowers is loose.

E. eburneum (ivory). *fl.* whitish; panicle cylindrical in outline. Autumn. *l.*, radical ones 2ft. to 3ft. in length, edged with rigid spines; cauline ones broad. *h.* 6ft. Brazil, 1872. Hardy. (R. H. 1876, 112.)

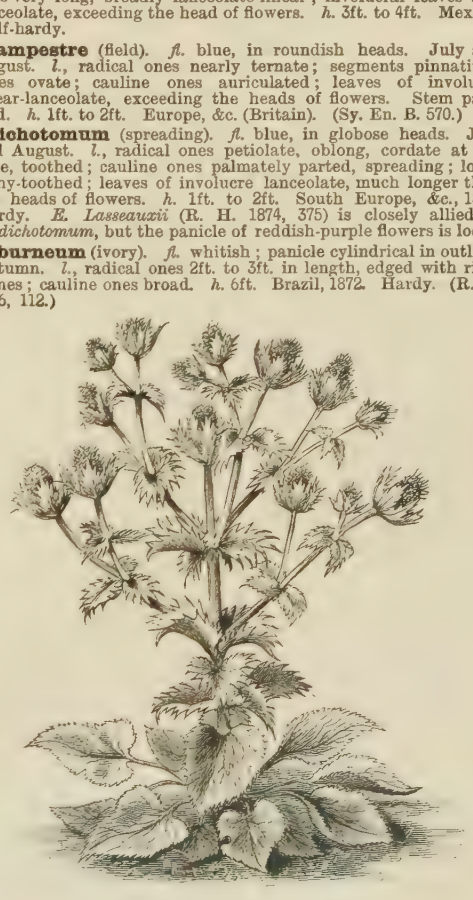


FIG. 729. ERYNGIUM GIGANTEUM.

Eryngium—*continued.*

E. giganteum (gigantic).* *fl.* blue, in ovate heads. July and August. *l.*, radical ones on long petioles, profoundly cordate, crenate-toothed; cauline ones stem-clasping, deeply lobed, serrated; leaves of involucre eight to nine, large, longer than the heads of flowers. Stem dichotomously branched, 3ft. to 4ft. high. Caucasus, 1820. Hardy. See Fig. 729.

E. maritimum (sea). Sea Holly. *fl.* very pale blue, in roundish heads. July to October. *l.* of a whitish-glaucous hue, coriaceous; radical ones on long petioles, roundish, cordate, spiny-toothed; superior ones stem-clasping, palmately lobed; leaves of involucre five to seven, ovate, exceeding the heads of flowers. *h.* 1ft. to 1½ft. Europe, &c. (Britain). (Sy. En. B. 569.)

E. pandanifolium (Pandanus-leaved).* *fl.* purplish, in rather small globose heads, with scarcely any involucre; panicle very large, dichotomous. *l.*, radical ones 4ft. to 6ft. long, very glaucous, concave, acuminated; margins spiny. *h.* 10ft. to 15ft. Monte Video. Half-hardy. (G. C. n. s., v. 76.)

E. paniculatum (panicled). *fl.* greenish-white, with a small horizontal involucre, rather large. *l.* with parallel nerves, linear, spiny-ciliated. Stem nearly naked, bearing at the apex umbellate branches; branches bearing one to three heads. *h.* 3ft. to 5ft. Monte Video. Half-hardy. (G. C. n. s., v. 76.)

FIG. 730. FLOWER OF ERYNGIUM PLANUM.

E. planum (flat-leaved). *fl.* blue, in roundish heads. July and August. *l.*, lower ones on long petioles, oval, cordate, undivided; superior ones five-parted, serrated; leaves of involucre six to eight, lanceolate, about equal to or exceeding the heads of flowers. *h.* 2ft. Eastern Europe, &c., 1596. Hardy. See Fig. 730.

E. platyphyllum (broad-leaved). A synonym of *E. serra.*

E. serra (saw). *fl.* white, in small globose heads. Autumn. *l.*, radical ones in a spreading rosette, 1ft. to 2ft. long, 4in. broad, nearly flat, varying from deeply pinnatifid to merely spinous on the margins. *h.* 4ft. to 6ft. Brazil, 1872. Half-hardy. SYN. *E. platyphyllum.*

E. yuccæfolium (Yucca-leaved). A synonym of *E. aquaticum.*

ERYNGO. *See* **Eryngium.**

ERYSIMUM (*Erysimon*, the old Greek name of Hippocrates, from *eryo*, to draw; on account of its effects in drawing blisters). Hedge Mustard. ORD. *Cruciferæ.* A genus of about seventy species of hardy annual, biennial, or perennial hoary herbs, natives of temperate and cold regions of the Northern hemisphere, usually branched. Racemes elongated, terminal, many-flowered. Leaves variable, usually oblong-linear, entire or toothed. A few species only of this somewhat extensive genus are worth growing; and these exceptions are, for the most part, very showy border plants, of extremely easy cultivation in any ordinary garden soil. Increased by seeds; the perennials by seeds and divisions.

E. alpinum (alpine).* *fl.* sulphur-yellow, sweet-scented. May. *l.* lanceolate, distantly toothed, covered with starry pubescence. Stem simple, straight. *h.* 6in. Norway, 1823. Perennial. SYN. *Cheiranthus alpinus.*

E. asperum (rough). *fl.*, petals yellow, with white claws. July. *l.* linear-oblong; lower ones dentately-runcinate, pubescent, scabrous, and, as well as the stem, greyish, with forked, appressed hairs. *h.* 8in. North America, 1824. Biennial. (H. F. B. A. i. 22.)

E. Marschallianum (Marschall's). *fl.* bright yellow. July. *l.* lanceolate, narrowed at the base, toothed. *h.* 1ft. Caucasus. Biennial.

E. ochroleucum (yellowish-white).* *fl.* pale yellow, scarcely scented; petals obovate. April to July. *l.* oblong-lanceolate, somewhat toothed, covered with two-parted hairs, or smooth. Stems decumbent, branched. Alps of Jura, 1819. Perennial. Plant procumbent. SYN. *Cheiranthus ochroleucus.*

Erysimum—*continued.*

E. o. helveticum (Swiss). *fl.* yellow; petals obovate. Spring. *l.* linear-lanceolate, either entire or toothed. Stems somewhat ascendent, clothed with forked hairs. *h.* 1ft. Rhætia, 1819. Biennial.

E. Perofskianum (Perofski's).* *fl.* deep reddish-orange. *h.* 1ft. Caucasus, 1838. This is one of the showiest hardy annuals grown; it is admirably adapted for beds, borders, edgings, &c.; and thrives almost anywhere; the seeds may be sown in September for a spring display. (B. M. 3757.)

E. pulchellum (pretty). *fl.* sulphur-yellow. Spring. *h.* 1ft. 1880. Perennial. A very pretty plant, differing from the majority of this genus in being of remarkably compact growth, and forming itself into a dense tuft of foliage. (R. H. 1880, 412.)

E. pumilum (dwarf).* *fl.* pale sulphur, fragrant. Summer. *l.* linear-lanceolate, somewhat toothed, greyish-green. *h.* 1in. to 3in. Europe, 1823. An elegant little perennial rock-plant. (L. B. C. 899.)

ERYTHEA (a fanciful name: Erythea, in the mythology of the Greeks, was one of the Hesperides, daughters of Evening, or the West, "who dwelt on an island of the ocean, on the western edge of the world, and guarded a garden with golden apples"). ORD. *Palmeæ.* A genus of two species of greenhouse palms, from Southern California. They are tall trees, with naked trunks, fan-shaped, plicate, filiferous leaves, and densely tomentose sheaths and inflorescence. Flowers solitary or in clusters, scattered along the numerous branches of the pendent panicle. The genus is very nearly allied to *Livistona*, of Australia and Eastern Asia, which differs in its distinct filaments, oblong fruit, with hard crustaceous pericarp, the leaf segments entire or nearly so, not filiferous on the margins. For culture, *see* **Areca.**

E. edulis (edible). A handsome species, with a slender trunk, 30ft. high, and 15in. or more in diameter. Each tree bears one to four panicles, blossoming late in March; the fruit clusters are said to weigh 40lb. to 50lb. Guadalupe Island. SYN. *Brahea edulis.*

ERYTHRÆA (from *erythros*, red; colour of flowers of some species). Centaury. SYNS. *Gyrandra* and *Hippocentaurea.* ORD. *Gentianeæ.* A genus of above thirty species of small hardy or half-hardy annual, biennial, or perennial plants. Flowers pink, yellow, or rarely white, terminal, sessile, or pedicellate. Leaves sessile, opposite, decussate; radical ones rosulate. Erythræas form elegant little plants for rockwork, grown in a sandy loam soil. Increased by seeds, or by divisions.

E. Centaurium (Centaury). *fl.* rose-coloured. *l.* ovate-lanceolate. Stem dichotomously panicled, corymbose. *h.* 3in. to 12in. North Africa, Europe (Britain). Annual. This plant was formerly much employed by physicians as a vermifuge. (Sy. En. B. 909.)

FIG. 731. FLOWERS OF ERYTHRÆA DIFFUSA.

E. diffusa (diffuse).* *fl.* bright deep rose. *l.* fleshy, entire, glabrous, shining, generally concave. *h.* 2in. to 3in. Western Europe. Perennial. A charming little rock plant. See Fig. 731.

Erythræa—*continued.*

E. littoralis (shore). *fl.* pink, crowded, sessile, fasciculate. June. *l.* ovate-oblong, obtuse. Stem simple or branched, dwarf, tetragonal. *h.* 3in. Europe (Britain). Biennial. (Sy. En. B. 908.)

FIG. 732. FLOWERING STEM OF ERYTHRÆA MUHLENBERGI.

E. Muhlenbergi (Muhlenberg's).* *fl.* of a deep pink colour, with a greenish-white star in the centre. Spring. *l.* oblong-obtuse, the floral ones lanceolate. Branches numerous, slender. *h.* 8in. California. An excellent plant for growing on rockwork, or for margins of a loamy border. See Fig. 732.

E. venusta (charming). *fl.* usually pink, star-like; corolla 1in. in diameter; tube slender; lobes of the limb elliptic, obtuse, deep rose-coloured, yellow at the base, as long as the tube. August. *l.* in pairs, scattered, sessile, ½in. to 1in. long, oblong or ovate-oblong, rounded at the apex; base rounded or cordate; upper and floral leaves narrower and acute or acuminate. Stem simple or cymosely branched above, few-flowered. *h.* 6in. to 10in. California, 1878. A slender erect hardy annual. (B. M. 6396.)

ERYTHRINA (from *erythros*, red; referring to the colour of the flowers). Coral-tree. ORD. *Leguminosæ.* A genus of about thirty species of trees and shrubs, principally natives of tropical regions in both the New World and the Old, and at the Cape. Flowers coral-red, large, in dense racemes, produced usually before the development of the large leaves (in a few species, on the ends of the annual shoots); calyx split, spathaceous, bilabiate; petals very unequal; standard large; upper stamen free to the base, or sometimes connate with the others half-way up the filaments; anthers uniform. Pod linear, turgid, torulose. Leaves constantly trifoliolate.

Cultivation. All the Erythrinas like a strong loamy soil, an abundance of water when not at rest, and exposure to bright sunlight. The tree and shrubby-stemmed species should be kept growing all summer in a warm house, and treated liberally, so as to induce vigorous growth. In September, water should be gradually withheld, so that the wood may ripen, the leaves fall off, and the plants go to rest for the winter. Early in spring, they should be repotted or top-dressed, placed in a hot, moist temperature, and supplied with plenty of water at the roots. This treatment should cause them to produce their large racemes of gorgeous flowers. If it be necessary to cut away any of the branches, it should not be done till after the flowers are over, as these are developed on the ripened wood

Erythrina—*continued.*

of the previous year. The herbaceous-stemmed species, *E. crista-galli* and *E. herbacea*, form a stout rootstock, from which shoots are annually produced, and upon these the flowers are borne in autumn. Both these kinds should be started in heat, in spring, unless when planted out of doors, in which case they may be left to start themselves on the approach of warm weather. For pot specimens, however, a little extra heat assists the rootstocks, and is conducive to the free production of shoots. As these increase in strength, a lower temperature will be sufficient, till, finally, the plants may be placed out of doors for the summer. By taking off the young shoots with a heel, in spring, and inserting them in sandy soil, on a little bottom heat, a stock is easily obtained. After flowering, the shoots die down, when the plants may be placed under stages in cool houses, where they can be kept dry and at rest till the following spring. Erythrinas, planted out of doors, require a covering of leaves or cocoa-nut fibre, to protect the boles from frost.

E. Corallodendron (Coral-tree). *fl.* deep scarlet, large, in long racemes, appearing when the leaves have fallen. May and June. *l.*, leaflets broad, rhomboid-ovate, acute; petioles unarmed. Stem arboreous, prickly. *h.* 6ft. to 12ft. West Indies, 1690. SYN. *E. spinosa.*

FIG. 733. PORTION OF ANNUAL HERBACEOUS FLOWERING SHOOT OF ERYTHRINA CRISTA-GALLI.

E. crista-galli (Cockscomb).* Common Coral-tree. *fl.* bright deep scarlet, disposed in large terminal racemes. May to July. *l.*, leaflets oval or ovate, glaucescent, coriaceous, bluntish; petioles prickly, glandular. Stems woody. *h.* 6ft. to 8ft. Brazil, 1771. This fine species is by far the most frequently cultivated one. In the southern counties, it is almost hardy. SYN. *E. laurifolia.* See Fig. 733. (B. M. 2161.)

E. glauca (glaucous). *fl.* copper-coloured. Summer. *l.*, leaflets ovate, glaucous beneath; petioles almost unarmed. Stem arboreous, prickly. *h.* 10ft. South America, 1819.

E. herbacea (herbaceous). *fl.* deep scarlet, distant; racemes elongated. June to September. *l.*, leaflets ovate or somewhat hastate. Branches herbaceous, annual, and, as well as the leaves, unarmed and glabrous. *h.* 2ft. to 3ft. Carolina, 1724. (B. M. 877.) *E. Bidwilli* is a hybrid between *E. herbacea* and *E. crista-*

Erythrina—*continued.*

galli, with annual shoots, and axillary and terminal spicate flowers.

E. Humei (Hume's). *fl.* brilliant scarlet, fading to purple, in a sub-verticillate spike; peduncles axillary, longer than the leaves, erect, rounded, studded with white, linear warts. *l.* ternate, rhomb-shaped, acuminate, with an obtuse point; petioles alternate, horizontal, longer than the leaves, armed with a few distant prickles. Stem erect, woody. *h.* 30ft. to 60ft. South Africa. A very elegant stove tree. (B. M. 2431, under name of *E. caffra.*)

Erythrina—*continued.*

E. laurifolia (laurel-leaved). A synonym of *E. crista-galli.*

E. speciosa (showy). *fl.* deep crimson; racemes and calyces velvety. August to October. *l.*, leaflets broad, slightly three-lobed, acuminated, glabrous; petioles and ribs of leaves prickly. Stems shrubby, prickly. *h.* 6ft. to 10ft. West Indies, 1805. (A. B. R. 443.)

E. spinosa (spinous). A synonym of *E. Corallodendron.*

Other very good garden forms, chiefly of *E. crista-galli*, are: *Cottyana*, flowers deep rich red; *floribunda*, flowers rosy-crimson;

FIG. 734. ERYTHRINA INDICA PARCELLI.

E. indica (Indian).* *fl.* of a splendid scarlet colour. *l.*, leaflets broad-ovate, acute, glabrous; petioles unarmed. Stem arboreous, prickly; spines black. *h.* 20ft. to 30ft. East Indies, 1814. There is a handsome white-flowered form of this species.

E. i. marmorata (marbled). *l.* large, broad, blotched and spotted with white in a very effective manner. Polynesia, 1879. An elegant variegated plant.

E. i. Parcelli (Parcell's). *l.* alternate; leaflets three, with a yellow variegation, sometimes forming a feather-like stripe along the costa and main veins, sometimes more diffused, and forming a band 1in. wide. Stem stout, woody. South Sea Islands. See Fig. 734, for which we are indebted to Mr. Wm. Bull.

Madame Belanger, flowers velvety, rich dark reddish-crimson; *ornata*, flowers dark vermilion; *ruberrima*, flowers large, brilliant crimson, rosy-tinted; *spectabilis*, leaves with fine bold variegation, markings chiefly yellow.

ERYTHROCHITON (from *erythros*, red, and *chiton*, a tunic; calyx red). ORD. *Rutaceæ*. A genus of four species of very ornamental stove evergreen trees, natives of Brazil, Guiana, and New Grenada. They thrive well in a compost of loam and leaf mould. Increased by seeds, or by cuttings.

Erythrochiton—*continued.*

E. braziliensis (Brazilian). *fl.* large, in the axillæ of the bract-like leaves, two to four, or more in a cluster, on short, bracteolate pedicels; calyx red; corolla white. July. *l.* alternate, simple, stalked, lanceolate, very long, quite entire, smooth. Axillary branches almost leafless, bearing the flowers at their ends. *h.* 10ft. Brazil, 1842. (B. M. 4742.)

E. hypophyllanthus (leaf-flowering). *fl.* white; cymes short, one to three-flowered, developed on the costa beneath. *l.* bold, cuneate-oblong, 1ft. to 1½ft. long. Columbia, 1853. Habit erect, unbranched. (B. M. 5824.)

ERYTHROLÆNA CONSPICUA. *See* **Cnicus conspicuus.**

ERYTHRONIUM (from *erythros*, red, the colour of the flowers in the European species; *Erythronion* is the name given by Dioscorides to a kind of Orchis). Dog's-tooth Violet. ORD. *Liliaceæ*. A genus of seven species of very ornamental dwarf, stemless, hardy, bulbous plants, of which one species is dispersed through Europe, Asiatic Russia to Japan, and the rest are North American. Flowers on a scape, solitary, pendulous; perianth segments six, erect or reflexed. Leaves radical, ovate, or ovate-lanceolate. They succeed in almost any light soil, but prefer a mixture of loam and peat. Propagated by offsets, which are produced freely when the plants do well. The best time for obtaining them, or for replanting, is immediately the leaves die away, after flowering. Erythroniums have a better effect when planted in groups than if placed in very small quantities separately; the bulbs should be inserted about 3in. deep. If left untouched afterwards, an annual top-dressing of good soil will be advantageous. Erythroniums succeed best in a sheltered position on a rockery, but are also suitable for the front line of mixed borders, or for shrubberies. They may also be grown in pots, in a cold frame, for greenhouse decoration when in flower. The flowers appear in March and April, and are attractive outside at that early season.

E. americanum (American).* *fl.* bright yellow, about 1in. across; perianth segments spreading, oblong-lanceolate, obtuse. *l.* elliptical-lanceolate, recurved at top, dotted and marbled with violet and white. *h.* 3in. to 6in. North America. (B. M. 1113.)

FIG. 735. ERYTHRONIUM DENS-CANIS, Large White Variety.

Erythronium—*continued.*

E. dens-canis.* Dog's-tooth Violet. *fl.* purplish-rose or whitish, about 2in. in diameter, solitary, drooping. *l.* blotched with purple-brown and white, radical, stalked, broadly-oval, rounded at the base, acuminated. *h.* 6in. Europe, 1596. (B. M. 5.) There are several forms, varying in the colour of the flowers. See Fig. 735.

E. grandiflorum (large-flowered). *fl.* yellow or cream-colour, with a more or less orange base, solitary or often in a raceme of two to six or more; segments lanceolate and somewhat acuminate, strongly recurved, 1in. to 2in. long. *l.* not mottled, always closely approximate, oblong-lanceolate, 3in. to 6in. long, with broad, usually short petioles. North-west America. (B. R. 1786.)

E. g. giganteum (gigantic). *fl.* white, with a yellow and orange base, large. *l.* mottled. Washington Territory. (B. M. 5714.)

ERYTHROPHLŒUM (from *erythros*, red, and *phloios*, bark; referring to the red juice which flows from the tree when cut). Red-water Tree. ORD. *Leguminosæ*. A small genus, containing three or four species of unarmed stove evergreen trees. Flowers small, almost sessile, in long, cylindrical spikes, forming a terminal panicle; petals five, small, slightly imbricate; stamens ten, inserted with the petals, free. Leaves bipinnate. For culture, *see* **Acacia.**

E. guineense (Guinea). *fl.* pale yellow. *l.* bipinnate; leaflets opposite, oval, oblique, from roundish to lanceolate, repand, acuminated and entire. *h.* 40ft. to 100ft. Sierra Leone, 1823. The bark of this tree is very poisonous.

E. Laboucherii (Labouchere's). *fl.*, spikes rather dense, nearly sessile, 1in. to 3in. long; petals longer than the calyx, with woolly edges; stamens more than twice as long as the petals, inserted in two rows. *l.*, pinnæ opposite, in two or three pairs; leaflets four to nine, alternate, obliquely obovate or orbicular, very obtuse or retuse. Branches glabrous. North Australia. A lofty, hard-wooded tree.

ERYTHRORCHIS. *See* **Galeola.**

ERYTHROTIS BEDDOMEI. *See* **Cyanotis kewensis.**

ERYTHROXYLEÆ. A tribe of **Lineæ** (which *see*).

ERYTHROXYLON (from *erythros*, red, and *xylon*, wood; some of the species have red wood). Including *Sethia*. ORD. *Lineæ*. A very widely-distributed genus of about fifty species of stove or greenhouse evergreen trees, with small white or yellowish-green flowers, which arise from the axils of the stipulaceous scales. *E. Coca* thrives in fibry loam; and cuttings of half-ripe shoots will root in sand, under a hand glass, in heat.

E. Coca (Coca). *fl.* greenish, small, three or four together, axillary. *l.* alternate, lanceolate or oval, entire. *h.* 3ft. to 6ft. 1869. This is one of the most interesting species of the genus, and is extensively cultivated; its leaves are largely employed by the South Americans as a masticatory, under the name of Coca. Coca also constitutes an article of commerce with the Indians. Greenhouse. (B. M. Pl. 40.)

ESCALLONIA (named in honour of Escallon, a Spanish traveller in South America, who found the first species of this genus in New Grenada). Ord. *Saxifrageæ*. A genus comprising about thirty-five species of ornamental half-hardy evergreen shrubs, all natives of South America. Flowers usually in terminal racemes or panicles. Leaves scattered, serrated, or entire. These fine plants grow freely in almost any ordinary well-drained garden soil. For training against walls, few shrubs are more suitable than *E. floribunda* and *E. macrantha*. In the south of England, and on the sea coast more especially, they flourish remarkably well, and are grown extensively as hedge or shelter plants. Propagation may be effected by cuttings, made of half-ripened wood, inserted in sandy loam, and covered with a hand-light; by layers, or by suckers.

E. floribunda (bundle-flowered).* *fl.* white; corymbs terminal, rather panicled, much-branched, leafy; petals obovate-spathulate. July. *l.* oblong, obtuse, finely crenulated or quite entire. Branches covered with clammy resin. *h.* 10ft. New Grenada, 1827. SYN. *E. montevidensis*. (B. M. 6404.)

E. illinita (varnished). *fl.* white; panicle terminal, many-flowered, leafy; petals on long claws. August. *l.* petiolate obovate or oblong, obtuse, crenulated, attenuated at the base, beset with glandular dots above, and clammy. Branches spreading, resinous. *h.* 5ft. Chili, 1830. (B. R. 1900.)

E. macrantha (large-flowered).* *fl.* crimson-red, rather large;

Escallonia—*continued.*

lower peduncles simple, axillary; upper ones racemose. June. *l.* ovate-elliptic, bluntish, serrated, shining, glandularly dotted below. Branches pubescent, glandular. *h.* 3ft. to 6ft. Chiloe, 1848. (B. M. 4473.) The variety *sanguinea* has deep red flowers.

E. montevidensis (Monte Video). A synonym of *E. floribunda.*

E. organensis (Organ Mountains).* *fl.*, petals deep rose-colour, five, spathulate, the claws erect, linear, so closely placed as to form a tube; limb exactly horizontally patent, oval or obovate, obscurely crenate at the margin. *l.* alternate, oblong, copious, erect, somewhat imbricated, glossy, rigid, dark green above, with a red margin, rather obtuse at the point, tapering at the base into a short petiole. Stems and branches rich red-brown. *h.* 2ft. to 4ft. Organ Mountains, 1844. A lovely plant. (B. M. 4274.)

E. Philippiana (Philippi's). *fl.* white; panicles terminal and lateral, densely crowded. July. *l.* rich green, somewhat spathulate, serrated. Valdivia, 1873. (G. C. n. s., x. 109.)

E. pterocladon (winged-branched). *fl.* white and pink, small, axillary. July. *l.* very small. *h.* 4ft. Patagonia, 1854. (B. M. 4827.)

E. pulverulenta (dusted). *fl.* white; petals obovate; racemes terminal, erect. June. *l.* elliptic, obtuse, on short petioles, serrulated, rather clammy above when young. Branches rather erect, somewhat trigonal. Shrub hairy in every part. *h.* 6ft. to 10ft. Chili, 1831. (S. B. F. G. ii. 310.)

E. punctata (dotted). *fl.* one to four, rarely more, in terminal corymbs, sub-erect; corolla deep dark red. July. *l.* bright green, sessile, or narrowed into a very short petiole, elliptic-ovate, acute, finely serrated, the serration often irregular; upper surface glossy, with deeply impressed veins; under paler, smooth, glabrous, or glandular pubescent, or gland-dotted. *h.* 3ft. to 6ft. Chili. A much-branched evergreen shrub. SYN. *E. rubra punctata.* This is easily distinguished from *E. rubra* by the stalked glands upon the young shoots, &c. (B. M. 6599.)

E. rubra (red).* *fl.* red; petals spathulate; peduncles two to seven-flowered, bracteate. July to September. *l.* obovate-oblong, acuminated, serrated, full of resinous dots beneath. Branches erect, when young clothed with glandular hairs. *h.* 3ft. to 6ft. Chili, 1827. Shrub smoothish. (B. M. 2890.)

E. r. punctata (red-dotted). A synonym of *E. punctata.*

ESCALLONIÆ. A tribe of **Saxifrageæ** (which *see*).

ESCHALOT. *See* **Shallot.**

ESCHSCHOLTZIA (named in honour of J. F. Eschscholtz, M.D., 1793-1831, a celebrated naturalist, who accompanied Kotzebue round the world). SYN. *Chryseis.* ORD. *Papaveraceæ.* Very ornamental hardy annual or perennial glabrous and glaucescent herbs. Sepals cohering in the form of a cap, deciduous. Leaves much divided into narrow segments. Perhaps all the Eschscholtzias here described are mere forms of one very variable species. These showy plants are largely employed in decorating flower borders in spring, summer, and autumn. They are of very easy culture in ordinary garden soil. Seeds may be sown in spring or autumn, in places where they are to flower.

E. californica (Californian).* *fl.* bright yellow, large. Summer. *l.* glaucous, tripinnatifid; segments linear. *h.* 1½ft. North-west America, 1790. Perennial. From this, the first species introduced, have sprung a legion of varieties with flowers of a white, pinkish, or pale yellow colour.

E. c. cæspitosa (tufted). *fl.* yellow, about 1in. across. Summer. *l.* divided into almost thread-like segments. *h.* 6in. A very pretty little annual, with a close, compact habit, and much branched near the base. SYN. *E. tenuifolia.* (B. M. 4812.)

E. c. crocea (yellow).* *fl.* deep rich orange. Summer. *h.* 1ft. California, 1833. Of this showy biennial, there are numerous forms, including white, red, striped, and a double orange-flowered kind.

E. tenuifolia (slender-leaved). A synonym of *E. c. cæspitosa.*

In addition to the foregoing, very showy garden forms have been raised, including *compacta* (orange); *Mandarin* (a gorgeous orange-crimson flowered sort); and several others.

ESPALIERS. A term applied to a mode of training fruit-trees in the open ground, either as permanent features or preparatory to placing them on walls or on a trellis inside a house. Many methods are employed, some of a temporary, and others of a permanent, character. For a single tree, a row of stakes about 5ft. high, driven in the ground, 9in. apart, is suitable. A narrow strip of wood is generally laid on the tops of the stakes, and a nail driven into each, to hold them firmly. Fruit-trees trained as

Espaliers—*continued.*

Espaliers, to separate borders running parallel to walks from the inside garden, sometimes have strained wires fixed for the purpose. Another mode is to have end posts, to which are secured top and bottom rails, with vertical strips of wood nailed to them. The trees may be trained to any desired shape as Espaliers, in the same way as if they were on walls. Full exposure to light

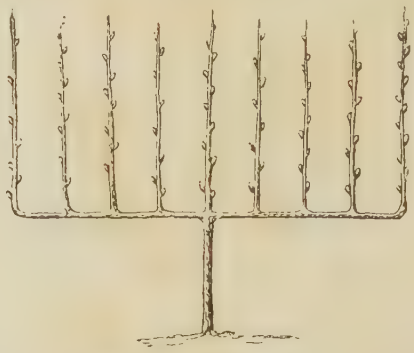


FIG. 736. FRUIT-TREE TRAINED UPRIGHT AS AN ESPALIER.

on both sides is obtained by proper thinning; but the advantages of a wall regarding the protection afforded cannot, of course, be similarly secured. An upright-trained fruit-tree is shown in Fig. 736; the stem is represented rather higher than is usual with trees trained in this way. Stakes at each end, and an Espalier frame fixed to them, would suit such a tree best; or one each of the former might be inserted to the upright branches separately. *See also* **Training.**

ESPARTO GRASS. *See* **Stipa tenacissima.**

ESPELETIA (named in honour of Don Jose de Espeleta, a Viceroy of New Grenada). ORD. *Compositæ.* A genus containing about eleven species of remarkable greenhouse woolly-leaved plants. Flower-heads yellow, sometimes 1in. or more across, corymbose. Leaves alternate, or rarely opposite, entire, lanceolate or linear, wholly covered with dense white or rusty-coloured wool. They thrive in a sandy-peat soil, and should be kept in a dry and airy part of the greenhouse. During damp weather, in winter, the plants should only receive sufficient water to keep the soil moist, and care must be taken that the woolly leaves are not wetted. The species here described are the only ones yet in general cultivation.

E. argentea (silvery). *fl.-heads* yellow, moderately large, the disk inclining to brown; florets all subtended by a ligulate, membranaceous scale. July. *l.* narrow-lanceolate, densely silky and strigose on both sides. *h.* 5ft. to 6ft. New Grenada, 1845. A very remarkable plant. (B. M. 4480.)

E. grandiflora (large-flowered). *fl.-heads* yellow, large. Summer. *l.* lanceolate. *h.* 10ft. New Grenada. This species yields a gum-resin of a beautiful yellow colour, which is largely employed by the native printers in the composition of their inks.

ETIOLATION. *See* **Blanching.**

EUADENIA (from *eu*, well, and *aden*, a gland; in allusion to the appendix at the base of the gynophore terminating in about five minute spherical knobs). ORD. *Capparideæ.* A genus of two or three species of stove herbs or sub-shrubs, from tropical Africa, only the one described below having yet been introduced to cultivation. It thrives in a well-drained loamy soil. Cuttings strike readily in bottom heat.

E. eminens (eminent). *fl.*, petals four, sulphur-yellow, two dorsal ones 4in. long, erect, narrowly linear-subulate, narrowed into a long claw; two lower ones smaller, pointing forward; sepals four, green, lanceolate, acuminate, ¾in. long. *l.* alternate, stalked, trifoliolate, quite glabrous. A striking plant, with a "singularly handsome inflorescence, which resembles a candelabrum in its ramification, the yellow petals looking like pairs of gas jets on each branch." West tropical Africa, 1880. (B. M. 6578.)

EUCALYPTUS (from *eu*, well, and *kalypto*, to cover as with a lid; limb of the calyx covering the flower before expansion, and afterwards falling off in one piece, in the shape of a lid or cover). Gum-tree. Including *Eudesmia*. ORD. *Myrtaceæ*. A genus of 140 or more species of tall evergreen greenhouse trees, with very few exceptions natives of Australia, where they constitute a large portion of the forest vegetation. Peduncles axillary, one-flowered, or bearing an umbel of from three to fifteen flowers. Leaves quite entire, coriaceous, usually alternate, very variable, even in the same tree, quite glabrous except in a very few of the species. It is worthy of remark that the Gum Trees, though among the largest trees in the world, have very small, or even minute, seeds. In their native country, the Eucalypti form extensive forests, and grow very fast, some of them reaching an immense height and having trunks in the same proportion. The timber is extremely durable, and is largely used by colonial ship-builders, implement-makers, engineers, &c. None of the species attain a size sufficiently large for use as timber in this country, as they are not hardy enough to withstand a severe winter outside. Several succeed on a south wall with protection in winter, and all are useful decorative greenhouse plants. They are called Gum Trees in consequence of the quantity of gum that exudes from their trunks. *E. globulus*, the Blue Gum, one of the most valuable timber trees of the Southern hemisphere, is also largely cultivated in many parts of the world, especially in the Mediterranean region and in malarious districts in Italy. Further, it is the species grown more than others in this country for its value in sub-tropical gardening, the leaves being of a distinct glaucous hue, and quite different from those of any other plant similarly employed. Eucalypti are best raised from imported seeds, which generally vegetate freely. They should be sown thinly in pots or pans of light sandy soil, and placed in a little heat. *E. globulus*, when intended to be used for sub-tropical bedding or for a group on a lawn, is best sown in August and grown on through the winter for use the following season. By this method, much larger and better plants may be obtained than when sowing is deferred till spring. It is best to raise new plants each year, as lifted ones do not regain their beauty of the preceding season, and they cannot be depended on to stand outside, at least, not in many places. Being fast growing plants, considerable space must be allowed when they become established, either in the open ground or in pots. A rather rich soil, composed of loam and decayed manure, with the addition of some charcoal, to keep it open, is most suitable. *E. citriodora* is very useful for growing in small pots for the conservatory, its scented leaves rendering it a general favourite. Comparatively few of the species are grown in this country.

E. amygdalina (almond-leaved). *fl.*, peduncles axillary or lateral, nearly terete, with four to eight flowers. *l.* alternate, linear-lanceolate, 3in. long, three lines broad, attenuated at the base. 1820. A moderate sized or large tree. (B. M. 3260.) In the Museum, No. 1, at Kew, there is a photograph of the base of a tree from Victoria, known as "Big Ben." The tree measured 56ft. in circumference, at base, and was 400ft. high. This species forms the highest of all known trees; one is recorded measuring 470ft. high, far exceeding even the well-known Giant-trees of California (*Sequoia gigantea*).

E. calophylla (beautiful-leaved). *fl.* rather large, in a terminal corymbose panicle, with one or two sometimes in the upper axils; umbels loose; peduncles flattened, or nearly terete; pedicels longer than the calyx tube. *l.* ovate, ovate-lanceolate, or lanceolate, obtuse or mucronate, acute, rather rigid, with numerous transverse parallel veins, the intramarginal one scarcely distant from the edge. A very beautiful tree. (B. M. 4036, under name of *E. splachnicarpa*.)

E. citriodora (lemon-scented).* *l.* oblong-lanceolate, covered with glandular hairs, which, when gently rubbed, emit a powerful odour, resembling that of the lemon-scented Aloysia. Australia. An interesting greenhouse plant.

E. coccifera (Coccus-bearing).* *fl.* purple; peduncles axillary or lateral, terete, or slightly compressed, bearing each an umbel of four to eight flowers. December. *l.* in the usual form mostly ovate-lanceolate, falcate and very oblique at the base, more or less acuminate, 4in. to 6in. long, thick with very oblique distant

Eucalyptus—*continued.*

anastomosing veins, the intra-marginal one at some distance from the edge. A small, generally very glaucous, tree. SYN. *E. daphnoides*. (B. M. 4637.) There is a variety, *parviflora*, having smaller flowers, and extremely short peduncles.

E. cordata (heart-shaped). A synonym of *E. pulverulenta*.

E. cornuta (horned). *fl.* red, yellow; peduncles axillary, terete or slightly compressed, each bearing six to twelve, or even more flowers, sessile, but not immersed in the receptacle. *l.* lanceolate or ovate-lanceolate, mostly under 4in. long, rather thick; the veins irregularly oblique, the intramarginal one at a distance from the edge. A tall shrub or small tree, with a smooth bark. (B. M. 6140.)

E. daphnoides (Daphne-like). A synonym of *E. coccifera*.

E. gigantea (gigantic). A synonym of *E. obliqua*.

FIG. 737. YOUNG TREE OF EUCALYPTUS GLOBULUS, showing Habit.

E. globulus (globuled).* Blue Gum-tree. *fl.* large, axillary, solitary, or two or three together, closely sessile on the stem, or on a peduncle not longer than thick. *l.*, of the young tree opposite, sessile, and cordate; of the full grown tree, lanceolate or ovate-lanceolate, nearly falcate, 6in. to 12in. long. *h.* sometimes exceeding 300ft. 1810. See Fig. 737. The leaves of this and other species have been supposed to possess febrifugal properties. Smoked in the form of cigars, they have been recommended in asthma. The oil obtained from the leaves is antiseptic.

E. Gunnii (Gunn's).* Cider-tree of Tasmania. *fl.* white; peduncles axillary, very short, each with three rather large almost sessile flowers. *l.* ovate-lanceolate or elliptical and obtuse to lanceolate-acute. A bush or small tree, sometimes attaining a height of 30ft. Perhaps the hardiest of all the species.

E. macrocarpa (large-fruited). *fl.* very large, solitary, on very short, thick, axillary peduncles. June. *l.* opposite, sessile, broadly cordate-ovate, acute or obtuse, often 6in. long, or even more, very thick and rigid. *h.* 6ft. to 10ft. 1842. A stout shrub, usually more or less mealy-white. In the "North" Gallery at Kew, there is a portrait of one of the few remaining specimens of this—one of the rarest of the Eucalypti. Although it has the largest flowers of all the species of the genus, it is only a shrub, and has been nearly extirpated by sheep in the one district where it was known to grow. (B. M. 4333; P. M. B. xv. 29.)

E. obliqua (oblique). Stringy-bark. *fl.*, peduncles axillary or lateral, and, as well as the branches, nearly terete; umbels four to eight-flowered. *l.* alternate, ovate-lanceolate, 4in. to 6in. long, acuminated, very unequal at the base. *h.* 150ft. to 250ft. The bark of this comes off in large slabs, and is used in making wigwams and roofs; and the natives also use it when they wish to cross a river. They strip off a large concave piece, and stop up the ends with mud, so as to keep the water out, thus forming a rude canoe, in which they paddle themselves over with a piece of wood, leaving it to rot or float away. SYN. *E. gigantea*. (H. F. T. i., 28.)

E. paniculata (panicled). *fl.*, peduncles angular; lower ones axillary; the rest disposed in a terminal panicle; petioles 5in. long. *l.* lanceolate, 3in. long, and five to six lines broad,

Eucalyptus—*continued.*

attenuated at the base. 1804. A large shrub or moderate-sized tree.

E. plurilocularis (many-celled). A synonym of *E. Preissiana.*

E. polyanthemos (many-flowered). *fl.* white, small, in umbels, shortly pedunculate, and usually several together in short oblong or corymbose panicles in the upper axils, or at the ends of the branches. *l.* on rather long petioles, broadly ovate-orbicular, or rhomboidal, obtuse, or rarely shortly acuminate, mostly under 3in. long, passing, in older trees, into ovate-lanceolate, obtuse, and 3in. long, or more, rather rigid, with fine diverging veins, the ultra-marginal ones distant from the edge. *h.* various, sometimes small, at others attaining 40ft. to 50ft. SYNS. *E. populifolia* and *E. populnea.*

E. populifolia (Poplar-leaved). A synonym of *E. polyanthemos.*

E. populnea (Poplar-like). A synonym of *E. polyanthemos.*

E. Preissiana (Preiss's). *fl.* yellow; peduncles axillary or lateral, very thick and much dilated, sometimes almost winged, under 1in. long, each with three large flowers, either sessile or tapering into a very short, thick, flattened pedicel. *l.* mostly opposite, although petiolate, from broadly ovate to ovate-lanceolate, very obtuse, or rarely acute, 3in. to 5in. long, very thick and rigid, the veins diverging and parallel, but not close, the marginal one at a distance from the edge. *h.* 8ft. to 12ft. A stout, rigid shrub. SYN. *E. plurilocularis.* (B. M. 4266.)

E. pulverulenta (powdery). *fl.*, peduncles axillary, very short, terete, or angular, each with three flowers not large, and sessile, or nearly so. June. *l.* sessile, opposite, cordate, orbicular or broadly ovate, obtuse, or almost acute, quite entire, more or less glaucous. A small tree. SYNS. *E. cordata* and *E. pulvigera.* (B. M. 2087.)

E. pulvigera (powdery). A synonym of *E. pulverulenta.*

E. robusta (robust). *fl.*, peduncles lateral and terminal, two-edged; pedicels short, compressed. *l.* alternate, ovate. *h.* 100ft. 1794. The variety *rostrata* has ovate-lanceolate acuminated leaves.

E. splachnicarpa (Splachnum-fruited). A synonym of *C. calophylla.*

E. tetragona (four-angled). *fl.* red; peduncles axillary, short, thick, angular or flattened, with three or more rather large flowers, on thick, angular, or flattened pedicels. July. *l.* mostly opposite, or nearly so, the upper ones alternate, from broadly ovate and very obtuse to lanceolate-falcate and almost acute, rarely more than 4in. long, thick and rigid, with diverging, but rather distant, veins. *h.* varying from a low scrubby shrub to a small tree of 20ft. to 25ft. 1824. SYN. *Eudesmia tetragona.* (S. F. A. 21.)

EUCHÆTIS (from *eu*, well, and *chaite*, hair; petals bearded inside). ORD. *Rutaceæ.* A genus of four or five species of greenhouse evergreen Heath-like shrubs, confined to South-western Africa. For cultivation, *see* **Diosma.**

E. glomerata (close-flowered). *fl.* white, glomerate at the tops of the branches; peduncles very short, bracteate. May. *l.* scattered, lanceolate, keeled, with a pellucid, rigidly, and ciliated margin. *h.* 2ft. Cape of Good Hope, 1818.

EUCHARIDIUM (from *eucharis*, agreeable; habit of plant). ORD. *Onagrarieæ.* A genus containing only a couple of species of very pretty hardy annuals, both Californian, extremely showy when grown in masses. Seeds may be sown in the open border, in spring or autumn. *E. Breweri* is probably not yet in cultivation.

E. concinnum neat).* *fl.* lilac-purple, solitary, on long pedicels; petals trilobate; sepals cohering at the tips, reflexed. Summer. *l.* glabrous, ovate-lanceolate, entire. *h.* 1ft. North America, 1787. (B. M. 3589.) *E. grandiflorum* (R. H. vi. 298) is merely a large-flowered variety of the above.

EUCHARIS (from *eu*, well, and *charis*, grace; very graceful, a manufactured name). ORD. *Amaryllideæ.* A small genus of tropical bulbous plants, from New Grenada. There are five species known, all of which are in cultivation, and three of them taking rank among the most popular of stove bulbous plants. For their cultivation, a temperature of 65deg. to 70deg., rising to 80deg. in summer; and, except for a few weeks in autumn, an abundance of water always will be found suitable. The soil should consist of two parts rich loam to one of leaf mould and manure, with the addition of charcoal, to keep it open. Rather large pots are best, so as to allow the roots to ramify freely, and they should be inserted deeply. Half-a-dozen strong bulbs in a 10in. pot will be suitable for *E. candida*, *E. grandiflora* (*amazonica*), and *E. Sanderiana*, whilst for the others a 6in. pot for the same number of bulbs will be ample. Where grown in large quantities, the bulbs may be planted out in beds beneath

Eucharis—*continued.*

which hot-water pipes are placed, though equally good results are obtainable if they are kept in pots and plunged in a tan or dung bed. If potted in good soil in the first instance, it will not be necessary to do more than top-dress the plants annually, repotting only when the bulbs are overcrowded. Liquid manure may be given with advantage, after the flower-scapes appear. If placed in an intermediate house whilst in flower, a longer display, and blossoms of better substance, will be the result. Offsets are developed rather freely by the bulbs when growing well, and if these be removed and potted up singly in 6in. pots, a good stock of plants may soon be obtained. After the leaves are all matured, less water, and a temperature a few degrees lower than that recommended for the growing period, will be necessary; always however, avoiding total drying off—treatment not essential to the free production of flowers, but likely to weaken the bulbs. When favourably situated, old-established plants of the above-named best kinds of Eucharis will bear two or three crops of flowers in the course of a year. Seeds are sometimes ripened on cultivated Eucharises, which may be sown as soon as ripe, in a warm house.

E. amazonica (Amazon). A synonym of *E. grandiflora.*

E. candida (white).* *fl.* pure white, drooping, 3in. broad; corona very prominent, divided into six pointed segments, to which the stamens are attached; umbel six to ten-flowered on scape 2ft. long. *l.* solitary on each bulb, broadly elliptic, acuminate; petiole long, compressed, 1ft. long. Bulb large as a hen's egg, with an elongated neck. New Grenada, 1851. (F. d. S. 788.)

E. candida (white). A garden name for *E. subedentata.*

E. c. grandiflora (large-flowered). A synonym of *E. grandiflora.*

E. grandiflora (large-flowered).* *fl.* pure white, drooping, 4in. to 5in. wide, borne in three to six-flowered umbels on erect scapes, about 2ft. long; corona tinged with green. *l.* several to a bulb, broadly ovate, acuminate, channelled, slightly waved and plaited; blade 8in., petiole 10in., long. Bulb egg-shaped, with a rather long neck. New Grenada, 1854. SYNS. *E. amazonica*, *E. candida grandiflora.* See Fig. 738. (B. M. 4971.)

E. Hartwegiana (Hartweg's). This species, already described in this work under **Caliphruria,** should now be placed here. (B. M. 6289.)

E. paradoxa (paradoxical). A synonym of *E. subedentata.*

E. Sanderiana (Sander's).* *fl.* pure white, with filaments and inside of tube yellow, about 3in. wide; corona suppressed; umbels three to seven-flowered, on erect scape, 18in. long. New Grenada, 1882. Habit and foliage of *D. grandiflora,* to which it may be compared also in the beauty and usefulness of its flowers. (B. M. 6676.)

E. subedentata (almost without teeth, in allusion to absence of corona). This is now the correct name of the plant described in this work as **Caliphruria subedentata.** SYNS. *E. candida* (of gardens) and *E. paradoxa.* (B. M. 6289.)

EUCHILUS. Included under **Pultenæa** (which *see*).

EUCHLÆNA (from *eu*, well, and *chlaina*, a mantle; in allusion to the large glumes). SYN. *Reana.* ORD. *Gramineæ.* Tropical fodder grasses, of annual duration. Male flowers in dense terminal panicles; females in axillary spikes. Leaves long, broad, strap-shaped. Stems tall, succulent.

E. luxurians (luxuriant). Teosinte. *fl.*, males on short axillary panicles; females in large terminal drooping panicles. *l.* 4ft. long, green, soft in texture. Stems 12ft. to 15ft. high, in tufts, as many as thirty stems springing from a single seed. Mexico. (B. M. 6414.)

EUCHROMA. Included under **Castilleja** (which *see*).

EUCLEA (from *eukleia*, glory; referring to the beauty of the ebony-like wood). SYN. *Diplonema.* ORD. *Ebenaceæ.* A genus containing some nineteen species of greenhouse evergreen shrubs, natives, for the most part, of the Cape of Good Hope. None are of any value from a purely horticultural standpoint. Flowers axillary, racemose, rarely paniculate or solitary. Leaves alternate or opposite, entire, oval-lanceolate or oblong, sometimes crisped or wavy. For culture, *see* **Diospyros.**

E. polyandra (many-stamened). *fl.* five to seven-fid, dicœcious. June and July. *l.* elliptic, alternate or sub-opposite. *h.* 4ft. to 6ft. 1774. SYN. *Diplonema elliptica.*

EUCNIDE. Included under **Mentzelia** (which *see*).

EUCODONIA. This genus is now included under **Achimenes** (which *see*).

EUCOMIS (from *eukomes*, beautiful-haired; alluding to the tufted crown of the flower-spike). ORD. *Liliaceæ*.

Eucomis—*continued.*

large, usually greenish flowers, surmounted by a tuft of empty leaf-like bracts. Eucomis thrive in any rich soil, and are increased by offsets.

FIG. 738. EUCHARIS GRANDIFLORA, showing Leaves and Inflorescence.

A genus of about half-a-dozen species of strong half-hardy bulbs, natives of the Cape of Good Hope. They have broad root leaves and a simple raceme of rather

E. amaryllidifolia (Amaryllis-leaved). *fl.*, raceme oblong, dense, 2in. to 3in. long; perianth green, segments oblong; scape cylindrical, terete, under 1ft. long. August. *l.* contemporary with the flowers, sub-erect, fleshy in texture, lorate-ligulate, narrowed

Eucomis—*continued.*

gradually to the base, obtuse, quite unspotted upon either back or face, channelled down the face in the lower half. Bulb ovoid. Cape Colony, 1878.

E. bicolor (two-coloured).* *fl.*, raceme dense, oblong, 3in. to 4in. long; perianth segments pale green, with a sharp purple edge, oblong; scape terete, ¼in. in diameter. August. *l.* sub-erect, oblong, unspotted, crisped towards the edge. Bulb globose, with copious fleshy root fibres. Natal, 1878. A handsome, robust-growing species.

E. bifolia (two-leaved). A synonym of *Whiteheadia bifolia.*

E. nana (dwarf).* *fl.* brown; scape clavate. May. *l.* broad-lanceolate, acute. *h.* 9in. 1774. (B. M. 1495.) *E. purpureo-caulis* (A. B. R. 369) is a form of this with a purple scape.

FIG. 739. EUCOMIS PUNCTATA, showing Habit and Single Flower.

E. punctata (spotted).* *fl.* green, brown; scape cylindrical. July. *l.* oblong-lanceolate, channelled, spreading. *h.* 2ft. 1783. See Fig. 739. (B. M. 913.)

E. p. striata (streaked). *fl.* green; scape cylindrical. June to December. *l.* lanceolate, spreading, striped. *h.* 2ft. 1790. (B. M. 1539.)

E. undulata (wavy). *fl.* green; scape cylindrical. March and April. *l.* ovate-oblong, wavy, spreading. *h.* 2ft. 1760. (B. M. 1083.)

EUCROSIA (from *eu*, good, and *krossos*, a fringe; in allusion to the beautiful fringe of the flower, formed by the cup of the stamens). ORD. *Amaryllideæ.* A very handsome greenhouse bulbous perennial. For culture, *see* **Pancratium.**

E. bicolor (two-coloured). *fl.* orange, ringent, nodding; umbellate. April. *h.* 1ft. Peru, 1816. Extremely rare. (B. M. 2490.)

EUCRYPHIA (from *eu*, well, and *kryphios*, covered; referring to the calyptra of the flower). ORD. *Rosaceæ.* A genus of three or four species of very handsome hardy evergreen or greenhouse shrubs or trees, of easy culture in a compost of loam and peat, and in a warm, sunny situation. Cuttings of young shoots will root in sand, if placed under glass.

E. Billardieri (Billardier's). *fl.* white, very showy, the broad petals often 1in. in diameter; peduncles much shorter than the leaves. *l.* simple, shortly petiolate, oblong, very obtuse, entire, coriaceous, glaucous or whitish underneath. Tasmania. A handsome greenhouse tree, attaining a very large size, although the smaller forms are often reduced to a bushy shrub. SYN. *Carpodontos lucida.*

E. cordifolia (heart-shaped-leaved). *fl.* white, large, axillary, solitary, stalked. *l.* cordate-oblong, crenated, downy. *h.* 20ft. Chili, 1851. Hardy.

E. pinnatifida (pinnatifid). *fl.* white, large, usually borne in pairs near the upper portions of the branches. *l.* pinnate, dark green. Chili, 1880. Hardy. (G. C. n. s., xiv. 337; Gn., Dec. 1877.)

EUDESMIA. Included under **Eucalyptus** (which *see*).

EUGENIA (named in honour of Prince Eugene of Savoy, who was a protector and promoter of botany, and possessed a botanic garden). Cambuy Fruit. Including *Jambosa* and *Syzygium.* ORD. *Myrtaceæ.* A large genus (about 700 species have been described) of stove and greenhouse evergreen trees or shrubs, with the general habit and inflorescence of **Myrtus** (which *see* for cultivation).

E. apiculata (apiculate). A synonym of *Myrtus Luma.*

E. australis (Southern). A synonym of *E. myrtifolia.*

E. brasiliensis (Brazilian). *fl.* white; pedicels one-flowered, slender, rising from the axils of the scaly leaves, along the branches, from velvety scaly buds. April. *l.* oval or obovate-oblong, bluntish, 3in. long, 1½in. broad. *h.* 6ft. Brazil. Stove. (B. M. 4526.)

E. buxifolia (Box-leaved). *fl.* white; peduncles axillary, branched, many-flowered, very short. May. *l.* obovate-oblong, obtuse, attenuated at the base, opaque, 1in. to 1½in. long. *h.* 4ft. to 6ft. West Indies, 1818. Stove.

E. fragrans. *See* **Myrtus fragrans.**

E. Jambos (Jambos). *fl.* white; racemes cymose, terminal. February to July. *fr.* white, red, or rose-coloured, about the size of a Medlar. *l.* narrow-lanceolate, attenuated at the base, acuminated at the apex. *h.* 20ft. to 30ft. East Indies, 1768. Stove. SYN. *Jambosa vulgaris.* (B. M. 1696.)

E. Luma. *See* **Myrtus Luma.**

E. Michelli (Michell's). *fl.* white; pedicels axillary, one-flowered, usually solitary, shorter than the leaves. *l.* ovate-lanceolate, glabrous. *h.* 12ft. Brazil. Stove.

E. myrtifolia (Myrtle-leaved). *fl.*, peduncles axillary, lateral or terminating short leafy shoots, bearing usually three or five flowers, sometimes more, in a loose, trichotomous panicle. *fr.* red, ovoid or nearly globular, crowned by the calyx limb. *l.* petiolate, varying from oval-oblong or almost obovate to oblong-elliptical or almost lanceolate, obtuse or acuminate, 2in. to 3in. long, cuneate or narrowed at the base, finely and almost transversely penniveined. *h.* 6ft. to 12ft. Queensland and New South Wales. A glabrous greenhouse shrub. SYNS. *E. australis* and *Jambosa australis.* (B. M. 2230.)

E. orbiculata (orbiculate). *fl.* white; peduncles single-flowered, axillary. November. *l.* nearly sessile, thick and coriaceous, very dark green. Mauritius, &c., 1824. Stove. (B. M. 4558, under name of *Myrtus orbiculata.*)

E. Pimenta. A synonym of *Pimenta vulgaris.*

E. Smithii (Smith's). *fl.* white, small, numerous, in a terminal trichotomous panicle, sometimes corymbose and shorter than the leaves, sometimes longer and more pyramidal. July. *fr.* white or purple, globular. *l.* petiolate, from ovate to ovate-oblong or ovate-lanceolate, obtuse or more or less acuminate, narrowed at the base, mostly 2in. to 3in. long, smooth, and finely penniveined. *h.* 8ft. New South Wales. A tree, sometimes small and slender, but attaining in some places a considerable height; quite glabrous. Greenhouse. (B. M. 1872, under name of *E. elliptica.*)

E. Ugni. *See* **Myrtus Ugni.**

EULALIA (from *eu*, well, and *lalia*, speech; in reference to the high reputation of the plants). ORD. *Gramineæ.* The very ornamental hardy grass described below should properly be referred to the genus *Miscanthus.* The varieties are well suited for growing in large pots or tubs in unheated conservatories; they also form excellent border plants in any good ordinary soil. Increased freely by divisions.

E. japonica (Japanese). *fl.* purplish, in panicles 8in. to 12in. long. *l.* linear-lanceolate, 3ft. in length, deep green in colour. Japan.

E. j. foliis striatis (striated-leaved).* *l.* with a creamy band running through the centre of each.

E. j. zebrina (zebra-leaved).* A very handsome form, with leaves having bars of yellow running crosswise, not longitudinally, as in the foregoing variety. See Fig. 740.

EULOPHIA (from *eulophos*, handsome-crested; referring to the handsome labellum or lip, which is furrowed into elevated ridges). ORD. *Orchideæ.* A numerous genus of stove terrestrial orchids, a few of which are pretty. Flower-scapes either simple or branched, bearing few or many flowers; sepals and petals nearly equal; lip pouched or spurred, with an entire or trilobed limb, bearded or crested in the middle. Leaves grassy, or lance-shaped and plaited. For culture, *see* **Calanthe.**

E. Dregiana (Drege's). *fl.* produced on spikes sepals; and petals chocolate-colour; lip white. Cape of Good Hope.

Eulophia—*continued.*

E. euglossa (pretty-lipped). *fl.*, sepals and petals green, lanceolate, acuminate, nearly equal, spreading; lip trifid; lateral segments semi-ovate, acute, greenish-yellow; middle segment semi-oblong, acute, somewhat crisp, white, with some radiating purple streaks on the base; spur clavate, green. *l.* cuneate-oblong, acute, 1ft. long. Old Calabar, 1866. A rather curious plant, requiring plenty of heat to flower it successfully. (B. M. 5561.)

E. guineensis (Guinea). *fl.* whitish-pink; lip membranous, complete; spur ascending. May to November. *l.* lanceolate. nerved. *h.* 1ft. Sierra Leone, 1822.

E. Helleborina (Helleborine). *See* **Habenaria Helleborina.**

E. macrostachya (large-spiked). *fl.* shortly pedicellate, 1in. in diameter across the lateral sepals, erecto-patent; lip very concave, golden-yellow, with red-purple stripes on the disk, broader than long, obtusely shallowly three-lobed. January. *l.* about two, from the top of the pseudo-bulb, oblong-lanceolate, acuminate, contracted into a petiole, membranous, plaited, about three-ribbed. Pseudo-bulbs elongate, conical, terete, striated. Ceylon, 1837. A very desirable plant, on account of its late flowering. (B. M. 6246.)

E. virens (greenish). *fl.*, sepals and petals yellowish-green, tessellated with brown lines, nearly equal, oblong, bluntly pointed, narrowed at base; lip longer than the petals, white, with purple streaks, three-lobed, the lateral ones being shortened, and the central one crisp at margin, obtuse and recurved at apex, and furnished with rows of dark hairs along its disk; spur short, conical. Pseudo-bulbs roundish-ovate, 2in. to 3in. long, bearing several narrow grassy leaves. Ceylon, 1866. (B. M. 5579.)

EUNOMIA (from *eu*, well, and *nomos*, order; the leaves opposite, and seeds twin). ORD. *Cruciferæ*. This genus contains a couple of species (both natives of the mountainous regions of Asia Minor) of very pretty little half-hardy evergreen sub-shrubs, admirably adapted for rockwork. Increased by cuttings, placed under a glass, in summer; or by seeds, sown in a similar situation, in spring.

Eunomia—*continued.*

E. oppositifolia (opposite-leaved). *fl.* white; racemes ten or twelve-flowered, terminal. June. *l.* opposite, almost orbicular, entire, smooth. Stem decumbent, branched. *h.* 6in. to 12in. 1827.

EUONYMUS (*Euonomon*, the name given to this plant by Theophrastus, from *eu*, good, and *onoma*, a name). Spindle-tree. ORD. *Celastrineæ*. A genus of interesting hardy or half-hardy, deciduous or evergreen, trees or shrubs. Flowers small, often greenish or purplish; peduncles axillary. Leaves opposite, petiolate, entire, or serrate. Branches terete. They are of very easy culture in any ordinary garden soil, and form excellent subjects for low, close fences, or shrubberies. The species with variegated leaves are well suited as edgings to large beds. Propagated readily by cuttings, about 3in. in length, of the last season's growth; these should be inserted in a fine compost of loam and sand, in early autumn.

FIG. 740. EULALIA JAPONICA ZEBRINA, showing Foliage, and Fully-expanded and Young Inflorescences.

E. americanus (American). Burning Bush; Strawberry Bush. *fl.* greenish-purple; petals nearly orbicular; peduncles one to three flowered. June. *fr.* scarlet. *l.* ovate to oblong-lanceolate, acute

Euonymus—*continued.*

serrated, almost sessile. Branches smooth, quadrangular. *h.* 2ft. to 6ft. North America, 1686. Hardy deciduous. (A. F. B. ii. 499.)

E. atropurpureus (dark-purple).* Burning Bush; Waahoo. *fl.* dark-purple, quadrifid; petals orbicular; peduncles many-flowered, compressed. June. *l.* oval-oblong, acuminate, serrated, stalked. Branches smooth. *h.* 6ft. to 14ft. North America, 1756. Hardy deciduous. (A. F. B. ii. 499.)

E. europæus (European).* *fl.* greenish-white, small, fœtid; petals oblong, acute; peduncles usually three-flowered. May. *l.* ovate-lanceolate, finely serrated. Branches smooth. *h.* 6ft. to 20ft. West Asia, Europe (Britain), &c. Hardy deciduous. (Sy. En. B. 317.)

E. fimbriatus (fimbriate).* *fl.* white, sub-umbellate, on long filiform peduncles. *l.* ovate, acuminate, fringed with long, parallel, toothed serratures. Branches terete, smooth. *h.* 12ft. Japan, India, &c. Half-hardy evergreen. (F. d. S. 1851, 71.)

E. grandiflorus (large-flowered). *fl.* white, very large, slightly nodding, inodorous; petals orbicular, flat, with curled edges; peduncles slender, flattened, three to six-flowered. April. *l.* ovate-oblong, obtuse, acutely-serrulate, with a tapering, entire base. Branches slightly four-cornered. *h.* 10ft. Nepaul, 1824. Half-hardy evergreen.

E. Hamiltonianus (Hamilton's). *fl.* white; petals lanceolate, cordate, with revolute edges; peduncles dichotomous, six-flowered. April. *l.* lanceolate, finely serrated. Branches smooth, terete. *h.* 5ft. to 20ft. Temperate Himalaya, Japan, 1825. Half-hardy evergreen. (B. F. F. 16.)

E. japonicus (Japanese).* *fl.* white, small; petals orbicular, fringed; peduncles flattened, crowded and panicled on the recent shoots, two or three times dichotomous, many-flowered. April. *l.* oblong, sharply serrulated, acuminated. Branchlets pendulous, slightly compressed. *h.* 20ft. Nepaul, 1804. Half-hardy in the northern counties of England. Evergreen. There are several handsomely variegated forms of this species, the names of which indicate the markings: *albo-marginatis*, *aureo-marginatus*, *latifolius-albus*, *latifolius-aureus*, &c. *E. radicans*, a small decumbent shrub, with oblong or orbicular serrated leaves, is a form of *E. japonicus*; it also has several highly ornamental variegated sub-varieties.

E. latifolius (broad-leaved). *fl.* white at first, but becoming purplish as they fade; petals oval, ovate; peduncles trichotomous, many-flowered. June. *l.* broad, ovate, toothleted. Branches smooth. *h.* 6ft. to 8ft. Europe, &c., 1863. Hardy deciduous. (B. M. 2384.)

E. verrucosus (warty-branched). *fl.* greenish-white or greenish-yellow, small; petals ovate; peduncles three-flowered. May. *l.* somewhat ovate. Branches warted. *h.* 10ft. to 20ft. Europe, 1730. Hardy deciduous. (J. F. A. 1, 49.)

EUPATORIUM (*Eupatorion* is a name used by Dioscorides and it is said by Pliny to have been so called after Mithridates Eupator, king of Pontus, who discovered one of the species to be an antidote against poison). Including *Bulbostylis*, *Conoclinium*, and *Hebeclinium*. ORD. *Compositæ*. A large genus of stove, greenhouse, or hardy, herbaceous or shrubby plants, many of which are very ornamental, whilst others are of no horticultural value. There are upwards of 400 species, most of which are American; they are rarer in the Old World. Flower-heads purplish, bluish or white, in terminal corymbs; receptacle naked; pappus rough, two-sexual; involucral bracts imbricate, two to three-seriate; florets all tubular, five-fid. Leaves opposite or rarely alternate, entire, dentate, or rarely dissected. Some of the hardy sorts form excellent border plants, and are of very easy culture in ordinary garden soil. These are propagated by division. *E. atrorubens* and *E. ianthinum* are distinct and useful winter-flowering plants, that require a warm greenhouse temperature. Cuttings of the young shoots strike easily in spring, if placed in heat, in a close frame. If grown on throughout the summer without being stopped, a large terminal flower-head will be produced by each the following winter. A house with a temperature of 50deg. to 55deg. will suit them when in flower, but this should be maintained, as the plants soon droop if exposed to cold. If pruned back annually after flowering, and repotted, large bushes may, in course of time, be formed. *E. atrorubens* grows the more vigorous of the two, and the flowers are darker than those of *E. ianthinum*, which is, however, a good old species, well worth attention. Both are generally known as Hebecliniums. The cool greenhouse species are readily increased by cuttings, inserted in spring. *E. Weinmannianum* is

Eupatorium—*continued.*

somewhat shrubby, and may be grown for several years if pruned in a little after flowering. It is a very useful subject for decorating or for cut flowers, in early autumn and winter. *E. riparium* continues the flowering period; and, as this grows rapidly, it is best to propagate each year. Any frame where plenty of air can be admitted, is suitable for it in summer, and a house where frost is merely excluded, is warm enough in winter. If placed in heat, the plants soon become weak and drawn. This species is slender-growing, and has a much finer appearance when three plants are placed in an 8in. pot, and the growths tied out with small stakes. The most suitable soil for the greenhouse Eupatoriums is a rich compost of loam and dried cow-manure, in about equal parts. Plenty of water is necessary at all seasons, and artificial or liquid manure may be used with advantage after the flower-heads appear.

E. ageratoides (Ageratum-like). *fl.-heads* pure white, numerous; corymbs compound, twelve to twenty-flowered. Summer. *l.* opposite, ovate, or somewhat cordate, stalked, coarsely toothed. *h.* 1ft. to 4ft. Plant branching. North America, 1640. Hardy herbaceous.

E. aromaticum (aromatic). *fl.-heads* white; corymbs loose, eight to twenty-flowered. Late summer. *l.* opposite, usually very shortly stalked, rounded, toothed. *h.* 3ft. to 4ft. North America, 1739. A strong-growing, variable, hardy species.

E. atrorubens (dark-red).* *fl.-heads* reddish, shaded with lilac, numerous. Autumn, winter. *l.* large, opposite, somewhat ovate, toothed. Mexico, 1862. A very neat and useful greenhouse species. SYN. *Hebeclinium atrorubens*. (I. H. 1862, 310.)

E. cannabinum. Hemp Agrimony. *fl.-heads* reddish-purple, in terminal tufts. July. *l.* three to five-foliate; leaflets lanceolate, serrate. *h.* 2ft. to 4ft. Stems erect, sub-simple, downy. Asia, Europe (Britain), &c. A very handsome native perennial, and one of the best of hardy species. (Sy. En. B. 785.)

E. Haageanum (Haage's). *fl.-heads* white, small, in loose corymbs. *l.* opposite, ovate, acuminate, coarsely serrated. South America, 1867. An erect shrubby greenhouse plant.

E. ianthinum (violet).* *fl.-heads* purple, produced in very large terminal corymbs. Winter. *l.* large, ovate, soft, deeply serrate at the edges. *h.* 3ft. Mexico, 1849. A very useful greenhouse, winter-flowering plant. SYN. *Hebeclinium ianthinum*. (B. M. 4574.)

E. macrophyllum (large-leaved). *fl.-heads* reddish-lilac, produced in large corymbs, in great profusion. Autumn, winter. *l.* large, cordate, dark green. *h.* 4ft. Tropical America, 1823. A very large greenhouse species, allied to the last-named. SYN. *Hebeclinium macrophyllum*. (R. H. 1866, 42.)

E. purpureum (purple). *fl.-heads* purplish; corymbs five to nine-flowered. Autumn. *l.* three to six in a whorl, somewhat ovate, or lanceolate, acuminated, rough, unequally toothed, downy beneath. *h.* 3ft. to 9ft. Hardy. North America, 1640.

E. riparium (river-bank).* *fl.-heads* white, numerously disposed in a panicle of terminal and axillary corymbs. Spring. *l.* oblong-lanceolate, deeply toothed. South America, 1867. A very desirable greenhouse plant. (R. G. 525.)

E. Weinmannianum (Weinmann's).* *fl.-heads* white, sweet-scented, large, corymbose. Autumn and winter. *l.* opposite, elliptic-lanceolate. South America, 1867. An elegant fragrant greenhouse plant. (G. C. n. s., v. 53.)

EUPHORBIA (a name given to this plant by Dioscorides; said by Pliny to have been so called in honour of Euphorbus, physician to Juba, King of Mauritania). Milkwort or Spurge. SYN. *Tithymalus*. Including *Poinsettia* and *Treisia*. ORD. *Euphorbiaceæ*. A genus comprising about 600 species of stove, greenhouse, or hardy, trees, shrubs, and herbs. The flowers are unisexual, collected into heads; these flower-heads are placed in umbels variously branched, or aggregated into clusters round the top of the stem. Only a very few plants of this genus are worth growing for horticultural purposes. The few hardy species of ornamental value make excellent border plants, and are fit subjects for naturalising on rocky, somewhat dry situations. These may be increased by cuttings, or by division. Two largely grown stove species, that are among the best and most showy of winter-flowering plants, are *E. fulgens* and *E. pulcherrima* (the latter is better known under the name of *Poinsettia pulcherrima*). Another, which is frequently represented in gardens by one or more plants,

Euphorbia—*continued.*

is *E. splendens*. The last is nearly always, more or less, in flower; and, although very ornamental, is not of much use, except to remain in the stove. Slow-growing Euphorbias, which are kept for the sake of their addition to a collection of succulent plants, do not require much water, nor a rich soil to grow in. Sandy loam and crushed pieces of brick, in nearly equal proportions, form a suitable compost. *E. fulgens* is a somewhat slender-growing plant, and is frequently found rather difficult to establish. It succeeds well planted out in the warmest part of a stove, and trained up the back wall or on the roof. It has also been found to grow and flower profusely in a house with Pines, the moisture in summer and drier heat in winter, suiting admirably. It is very impatient of root disturbance, and will not bear sudden changes of temperature without losing its leaves. For culture in pots, young plants may be raised annually. Cuttings 3in. long are best; they should be inserted about June, three in a small pot, and kept close in a warm propagating frame until rooted. These may be afterwards kept growing in heat, and transferred bodily into larger pots, without disturbing the roots. If treated in this way, they need not be stopped, and the single shoots will consequently be much stronger. The plants will not bear cold at any time, but will succeed in frames during the latter part of summer. The flowers are small, produced all along the upper part of the shoots in winter, so that the ripening of the latter by exposure to sun, is important. If kept a little cooler when in flower, they last a long time in beauty, and may be used for cutting, although the leaves frequently droop very quickly. When flowering is over, the plants should be kept quite dry and allowed to rest for a period of three or four months. As is the case with nearly all the species, the beauty of *E. pulcherrima* does not reside so much in the flowers as in the bracts with which they are surrounded. The system of culture is much the same as with the species already described, but varies in some respects, as the plants are much stronger-growing. Any old ones that have been resting should be introduced to heat about the beginning of June, and, if kept watered, will soon supply plenty of cuttings. These are best inserted singly in small pots, without crocks, in order to preserve the roots afterwards. The best summer quarters is on a spent hotbed, where the tops can be kept near the glass at all times, being lowered, as becomes necessary, by the removal of the manure underneath. It is advisable to put in several batches of cuttings successionally, as plants of various heights may then be obtained. The general plan is to grow on young ones annually, without stopping, the object being to produce a large terminal head of bracts on each. The old plants may also be grown if desired. They will not bear exposure to a low temperature in autumn, the result being invariably the loss of either the roots or leaves. When the bracts appear, more heat and some manure water may be applied, to expand them, and the plants should afterwards be kept a little cooler, to prolong the season in which they remain attractive. *E. pulcherrima* succeeds best in a soil composed of one-half turfy loam, the remainder being equal parts of dried cow-manure and leaf soil. Pots 5in. to 7in. in diameter are suitable for single plants to flower in. Retaining the foliage in good condition throughout the season, is an indication of good culture, and one of the main provisions for securing the full development of the flower-heads. Sudden

Euphorbia—*continued.*

changes of temperature in either direction must be avoided, and the plants exposed to plenty of light and full sunshine, except when it is very strong, in summer. After flowering, they should be kept quite dry, in a warm place, to supply cuttings the next year.

E. atropurpurea (dark-purple). *fl.* (= bracts) deep red-purple, or blood-coloured, large, broadly oblong, obtuse, combined at the base; involucre small, cup-shaped, red, with four retuse, fleshy yellow-green glands at the margin. March. *l.* numerous, lanceolate, tapering at the base, obtuse, pale glaucous-green, patent or drooping. *h.* 3ft. to 6ft. Teneriffe. A very pretty greenhouse species. (B. M. 3321.)

E. Cyparissias (Cypress Spurge). *fl.* yellow, umbellate; involucral leaves somewhat cordate, about twenty in number, often yellow. Spring. *l.* linear, quite entire, somewhat crowded. *h.* 1ft. to 2ft. Europe (naturalised in Britain). Hardy. (Sy. En. B. 1262.)

E. fulgens (shining). *fl.*, bracts bright orange-scarlet, axillary, forming long wreaths. *l.* bright green, lanceolate. *h.* 4ft. Mexico, 1836. Stove. One of the handsomest of winter-flowering plants. SYN. *E. jacquiniæflora*. (B. M. 3673.)

E. jacquiniæflora (Jacquinia-flowered). Synonymous with *E. fulgens*.

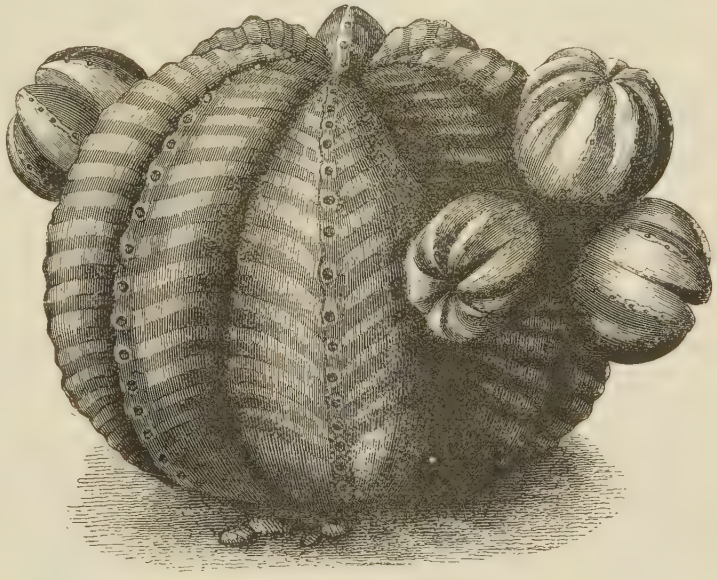


FIG. 741. EUPHORBIA MELOFORMIS.

E. meloformis (Melon-like). *fl.* greenish. Plant unarmed, with many angles. *h.* 6in. to 9in. Cape of Good Hope, 1774. Stove or warm greenhouse. See Fig. 741.

E. Monteiri (Monteiro's). *fl.* green; involucre sub-regular campanulate, turbinate, or hemispherical. June. *l.* fleshy, glabrous, narrow, spathulate. Branchlets floriferous. *h.* 2ft. to 6ft. Bahia, 1864. A very remarkable species, on account of the curious successive productions of the staminate flowers. Stove. (B. M. 5534.)

E. Myrsinites (Myrsinites). *fl.* yellow, in an umbel of from five to nine rays, surrounded by an involucre of ovate, sharp leaflets. Summer. *l.* fleshy, concave, light green, sessile. South Europe. A very ornamental hardy prostrate species. (S. F. G. 471.)

E. pulcherrima (pretty). *fl.* greenish-yellow, subtended by large vermilion bracts, small. Winter. *l.* ovate-elliptical, sub-acute, petioled. *h.* 2ft. to 6ft. Mexico, 1834. Shrub. SYN. *Poinsettia pulcherrima*. (B. M. 3493.) There is a variety of this with creamy-white bracts, and another (*E. p. plenissima*) with double series of bracts (G. C. n. s., v. 17).

E. splendens (splendid). *fl.*, bracts bright red, waxy, clustered. *l.* bright green, texture thin, rather small. Stems dark-coloured, closely set with long, stout, sharp thorns. *h.* 4ft. Bourbon, 1826. A handsome stove species, with sturdy branching habit.

Several hardy species of *Euphorbia*, now almost lost to our gardens, are well worth culture. Among these may be mentioned *aleppica*, with dense terminal heads of flowers, and crowded linear-oblong leaves; *Characias*, with the flower-stalks equal in length and verticillate; *pilosa*, with dense terminal tufts of greenish-yellow flower-heads, and linear-oblong leaves. Among the species indigenous to this country, *amygdaloides* and *Paralias*

Euphorbia—*continued.*

are well worthy a place in the wild garden, and in the margins of shrubberies.

The following is a list of species sometimes grown in company with succulent plants: *abyssinica, anacantha, antiquorum, aphylla, canariensis, capensis, Caput-Medusæ, erosa, globosa, grandicornis, grandidens, hystrix, imbricata, mammillaris, mauritanica, neriifolia, officinarum, pendula, resinifera, scolopendria, serpens, squarrosa, trigona, xylophylloides.*

EUPHORBIACEÆ. A very large order of trees, shrubs, or herbs, usually abounding in milky juice. The species are found in all except Arctic climates. Flowers one-sexual, bracteate or involucrate, sometimes achlamydeous. Leaves opposite or alternate, simple, often stipulate. Well-known genera are: *Euphorbia, Jatropha, Ricinus,* and *Phyllanthus.* There are about 200 genera and 3000 species.

EUPHRASIA (from *euphraino,* to delight; plants supposed to cure blindness). Eyebright. ORD. *Scrophularineæ.* Dwarf herbs. Flowers white, yellow, or purple, in dense, secund, or interrupted bracteate spikes. Leaves opposite, toothed or cut. About twenty species belong to this genus, but none are of sufficient horticultural value to merit mention here.

EUPODIUM. *See* **Marattia.**

EUPOMATIA (from *eu,* well, and *poma,* a lid; calyptra covering the flower before expansion, in the manner of an extinguisher). ORD. *Anonaceæ.* This exclusively Australian genus contains a couple of species of fine greenhouse evergreen shrubs. Peduncles short, one-flowered, terminal or lateral. Leaves alternate, entire, shortly petiolate. They thrive in a compost of sandy peat and fibry loam. Cuttings of ripened shoots will root in sandy soil, if placed under a hand glass.

E. Bennettii (Bennett's). *fl.* solitary, terminal, on a short peduncle above the last leaf, when fully expanded rather more than 1in. in diameter. *l.* oblong-lanceolate, acuminate, or acute, 3in. to 5in. long, narrowed at the base into a short petiole, which is again enlarged at the base, and shortly decurrent on the stem, leaving oblique raised lines when they fall off. *h.* 1ft. to 2ft. (B. M. 4848, under name of *E. laurina.*)

E. laurina (Laurel-like). *fl.* greenish-yellow; peduncles one-flowered, axillary. *l.* oblong, coriaceous. *h.* 4ft. 1824.

EURYA (from *eurys,* large; wrongly applied to the flowers, which are comparatively small). SYN. *Geeria.* ORD. *Ternströmiaceæ.* Above thirty forms belonging to this genus have been described, but probably not more than ten or a dozen are specifically distinct, the rest being merely varieties, mostly of *E. japonica.* They are very ornamental half-hardy or greenhouse evergreen shrubs, with axillary pedicels. All are natives of Japan, China, the Indian Archipelago, &c. Euryas are of easy culture, in peat or leaf soil. Cuttings, made from the ends of the young shoots, root freely in sandy soil, in a gentle heat. When rooted, insert them in small pots, in either peaty or loamy soil, and again place in heat, where they can have the benefit of a good syringing, to encourage quick growth, and get them well established. The variegated form given below is one of the most useful plants for conservatory, hall, or corridor decoration, especially during winter.

E. japonica (Japanese). *fl.* greenish-white, generally in clusters of from three to six. *l.* very variable, in the type ovate, attenuated. Japan. A half-hardy evergreen shrub.

E. j. latifolia variegata (variegated broad-leaved).* *fl.* white, small, on axillary fascicled peduncles. *l.* variegated with pale yellow, glabrous, entire, oblong-lanceolate, obtusely-acuminate. Japan, 1871.

EURYALE (mythological: *Euryale,* one of the Gorgons, represented with fierce thorny locks; in allusion to the thorny nature of the plant). ORD. *Nymphaceæ.* An annual stove aquatic. Before the introduction of the Victoria Water-lily, the Euryale was the noblest aquatic plant in cultivation. Its leaves are circular in form, about 2ft. in diameter, with prominent spiny veins on the rich purple under side, the upper side being olive-green, puckered and spiny. For cultivation, *see* stove species of **Nymphæa.**

E. ferox (fierce).* *fl.* deep violet; petioles and calyces covered with stiff prickles. September. *l.* large, peltate. East Indies, 1809. Reproduces itself freely by means of seeds, which ripen on the plant and germinate at once, if not kept dry. (B. M. 1447.)

EURYBIA. *See* **Olearia.**

EURYCLES (from *eurys,* broad, and *kleio,* to close up; referring to form of flower, the cup of which is frequently imperfect). SYN. *Proiphys.* ORD. *Amaryllideæ.* Handsome, bulbous plants, allied to *Pancratium. E. amboinensis* requires stove treatment; the second, and only other, species thrives in a warm greenhouse. After growth is completed, water should be withheld for a few weeks, so that the bulbs may ripen and rest.

E. amboinensis (Amboyna). *fl.* white, produced in a many-flowered umbel, supported by a stout scape; perianth with a cylindrical tube and regular limb of equal segments; stigma simple; corona not one-fourth as long as the perianth lobes. March. *l.* very broad, cordate. *h.* 1ft. to 2ft. Amboyna, 1759. SYNS. *E. australasica, Pancratium amboinense* (B. M. 1419), and *P. australasica.*

E. australasica (Australian). A synonym of *E. amboinensis.*

FIG. 742. EURYCLES CUNNINGHAMI.

E. Cunninghami (Cunningham's).* Brisbane Lily. *fl.* white; umbels less crowded than in *E. amboinensis*; stigma three lobed; corona two-thirds as long as the perianth lobes. *l.* ovate, not cordate. *h.* 1ft. Queensland. See Fig. 742. (B. M. 3398.)

EURYGANIA (from *eurys,* wide, and *ganos,* brightness; Eurygania was a wife of Œdipus). ORD. *Vacciniaceæ.* A genus of about a dozen species of ornamental greenhouse evergreen shrubs, with pendent branches, allied to **Thibaudia** (which *see* for cultivation). All are natives of the Andes of South America.

E. ovata (ovate). *fl.* in very spreading, shortly peduncled, axillary corymbs, 4in. to 5in. across; calyx deep red; corolla urn-shaped, red; mouth whitish. July. *l.* ovate-acute, serrulate, 1in. to 1½in. long. Stem stout; branches long, rambling, cylindric, green. 1878.

EUSCAPHIS (from *eu*, well, and *skaphis*, a bowl; in allusion to the persistent, bowl-like calyx). ORD. *Sapindaceæ*. A genus containing two species of hardy, glabrous shrubs, natives of Japan. Flowers small, hermaphrodite; calyx persistent, five-cleft, imbricate. Leaves opposite, stipulate, imparipinnate; leaflets coriaceous, serrulate, stipulate; stipules deciduous. The species will thrive in any good loamy soil, in the ordinary shrubbery border. Propagated by seeds, or by cuttings.

E. staphyleoides (Staphylea-like). *fl.* white or yellowish, small, numerous, disposed in terminal panicles. *fr.* red when ripe, bladdery, remaining on the bush until winter approaches. *l.* opposite, pinnate, smooth. *h.* 10ft. to 12ft. This plant is highly prized in its native country for its medicinal properties. (S. Z. F. J. 67.)

EUSTEGIA (from *eu*, well, and *stego*, to cover; in reference to the triple corona). ORD. *Asclepiadeæ*. A genus containing four species of dwarf, decumbent, glabrous, greenhouse herbs, all natives of Southern Africa. Flowers small, in few-flowered, terminal or axillary cymes. Leaves opposite, linear, often hastate. For culture, *see* **Ceropegia.**

E. hastata (hastate). *fl.* white, sub-umbellate; umbels interpetiolar; corolla rotate; corona triple, each composed of five leaves. June. *l.* opposite, hastate, ciliated. 1816.

EUSTOMA (from *eustomos*, of beautiful countenance, *eu*, well, and *stoma*, a mouth; referring to the corollas). SYN. *Arenbergia*. ORD. *Gentianeæ*. A genus containing only the two species here described. Flowers white, purplish, or blue, pedunculate. Leaves opposite, amplexicaul or sessile. The species are elegant little plants, closely allied to **Lisianthus** (which *see* for culture).

E. exaltatum (exalted). *fl.* purple, corymbose; corolla with a funnel-shaped tube, which is contracted above the apex; segments crenated. July. *l.* spathulate. *h.* 2ft. South United States, 1804. Greenhouse herbaceous. (B. R. xxxi. 13.)

E. Russellianum (Russell's). *fl.* lavender-purple, corymbose. July. *l.* ovate to lanceolate-oblong. Stem terete. *h.* 1ft. to 2ft. Nebraska to Texas, 1804. Hardy annual. (B. M. 3626.)

EUSTREPHUS (from *eu*, good, and *strepho*, to twine; referring to the habit of the plant). ORD. *Liliaceæ*. A monotypic genus. For culture, *see* **Dianella.**

E. latifolius (broad-leaved). *fl.* pale purple; pedicels two to six together in the upper cells, filiform, but rigid, four to nine lines long, articulate close under the flower, and persistent. June. *l.* sessile, or nearly so, varying from broadly ovate-lanceolate to narrow-linear, usually tapering to a point, of a firm texture, with numerous fine but prominent nerves, usually 2in. to 4in. long. Stems much branched, often climbing to a great height, weak and flexuose, but not twining. New South Wales. (B. M. 1245.)

EUTAXIA (from *eutaxia*, modesty; in allusion to the delicate and modest appearance of the plants when in flower). ORD. *Leguminosæ*. A genus of eight species of elegant, greenhouse, evergreen shrubs, all natives of Australia. Flowers golden, simple. Leaves opposite, decussate. For culture, *see* **Chorizema.** *Sclerothamnus* is included, by Bentham and Hooker, under this genus.

E. empetrifolia (Empetrum-leaved). The correct name of plant described as *Sclerothamnus empetrifolia*.

E. myrtifolia (Myrtle-leaved).* *fl.* numerous along the branches; pedicels axillary, twin. August. *l.* lanceolate or obovate-lanceolate, mucronate. *h.* 2ft. to 6ft. 1803. (B. M. 1274.)

E. pungens (stinging). A synonym of *Dillwynia pungens*.

EUTERPE (mythological: *Euterpe*, from *euterpes*, well-pleasing, was one of the nine Muses). ORD. *Palmæ*. A small genus of about eight species of tall-growing, elegant, unarmed, stove palms, natives of tropical America and the West Indian Islands. Leaves pinnatisect; segments narrowly linear-lanceolate; leaf-sheaths long, cylindrical, pale green, "finally falling away completely along with the rest of the leaf, so that the stems always appear clean and naked up to the base of the lowest remaining leaf, forming a striking contrast to many fan-shaped Palms, where the leaves hang about the crown of the tree in every state of decay." To be grown to perfection, Euterpes should have plenty of heat, and a rich, loamy soil. They attain a height of from 40ft. to 120ft. in their native habitats.

Euterpe—*continued.*

E. edulis (edible). *l.*, segments lanceolate, acuminate; rachis and nerves scaly beneath. Trunk cylindric, 40ft. to 100ft. high. Brazil, &c.

E. montana (mountain). *l.*, segments lanceolate, spreading, attenuated; petioles scaly beneath. Stem 40ft. or more high. The portion of the plant (in this and other species) which is eaten, either as a fresh vegetable or as a pickle, is the terminal bud and the soft interior part of the stem.

E. oleracea (culinary). Cabbage Palm; Cabbage-tree. *l.*, segments lanceolate-linear, acuminate, glabrescent. Spadix branches furfuraceous, tomentose. Trunk 80ft. to 120ft. high. West Indies, &c.

EUTHALES. Included under **Velleia** (which *see*).

EUTOCA. A synonym of **Phacelia** (which *see*).

EUXENIA. A synonym of **Podanthus** (which *see*).

EVALLARIA. A synonym of **Polygonatum** (which *see*).

EVELYNA. A synonym of **Elleanthus** (which *see*).

EVENING FLOWER. *See* **Hesperantha.**

EVENING PRIMROSE. *See* **Œnothera.**

EVERGREEN BEECH. *See* **Fagus betuloides.**

EVERGREEN LABURNUM. *See* **Piptanthus nepalensis.**

EVERGREEN OAK. *See* **Quercus Ilex.**

EVERGREEN THORN. *See* **Cratægus Pyracantha.**

EVERLASTING PEA. *See* **Lathyrus sylvestris platyphyllus.**

EVERLASTINGS. This term is applied to a section of flowers with coloured bracts that retain a

FIG. 743. BUNCH OF EVERLASTING FLOWERS HELICHRYSUMS

Everlastings—*continued.*

considerable portion of their beauty for a long time after being cut and dried. In addition, many are among the best of ornamental plants, either cultivated in pots or in the open ground. The principal genera that supply flowers suitable as Everlastings are: *Acroclinium*, *Aphelexis*, *Helichrysum*, *Rhodanthe*, *Waitzia*, and *Xeranthemum*, The title is more particularly applied to the many highly-coloured varieties of *Helichrysum bracteatum*. These are termed Immortelles by the French, and are more largely used by them than in this country. To obtain them in the best condition, they should be gathered on a dry day, when each flower-head is sufficiently open to show the inside of the bracts without exposing the centre. If frequently examined, the whole stock may be secured in this condition. They should be hung, head downwards, in a cool shed, and allowed to remain until dry. The individual flower-heads may be wired, and used, with good effect, among dried ornamental grasses, in winter, either in high glasses or vases. The French use large quantities to form memorial wreaths and crosses. If properly gathered and dried, many of the species will keep good, excepting that some of the colour vanishes, for two or three years. A new stock, is, however best grown and collected each year. A bunch of Helichrysums, showing the proper stage for gathering, is represented in Fig. 743.

EVE'S CUSHION. *See* **Saxifraga hypnoides.**

EVOLVULUS (from *evolvo*, to untwist; to distinguish it from *Convolvulus*, many of the species of which are twiners). ORD. *Convolvulaceæ*. Stove, annual or perennial, prostrate or creeping, rarely erect herbs. Peduncles axillary, one or few-flowered; corolla subrotate, campanulate, or funnel-shaped, plicate. Leaves entire. There are about seventy known species, distributed throughout all tropical regions, but most of them are natives of Brazil. The species described below is the only one worthy of mention here. For culture, *see* **Convolvulus.**

E. purpureo-cæruleus (purple-blue). *fl.* purplish-blue, terminal on the leafy branches, pedicellate; corolla rotate, rich ultramarine-blue, with the centre white, and a purple ray diverging from that up the centre of each lobe. July and August. *l.* small, lanceolate, acute, entire. Stem quite woody below, and often about half-way up. *h.* 1½ft. Jamaica, 1845. Perennial. (B. M. 4202.)

EXACUM (a name used by Pliny, and derived by him from *ex*, out, and *ago*, to drive; in allusion to its supposed expelling powers). ORD. *Gentianeæ*. A genus containing about a score species of very pretty, erect, branched, stove or greenhouse, annual or perennial herbs, natives of India and Eastern Asia, the Malayan Archipelago, and Socotra. Flowers terminal and axillary; corolla salver-shaped or sub-rotate, with a globose or ventricose tube. Leaves opposite, decussate, sessile. The species are not often seen in gardens. They thrive best in a compost of peat and turfy loam, in equal proportions, and a plentiful supply of water is necessary. Seeds should be sown in April, and placed in bottom heat, and the seedlings carefully shifted into larger pots as required. Several other species of this elegant genus, besides those given below, are well worth growing, but as yet await introduction.

E. affine (related). *fl.* bluish-lilac, agreeably scented; stamens yellow. Summer and autumn. *l.* stalked, broadly ovate. *h.* 6in. Socotra, 1882. A compact-habited, free-flowering, warm greenhouse perennial. (G. C. n. s., xxi. 605.)

E. macranthum (large-flowered).* *fl.* about 2in. across, of a deep rich blue-purple colour, with large, bright yellow stamens, disposed in terminal and axillary, corymbose heads. December. *l.* large, glabrous, glossy. *h.* 1½ft. Ceylon, 1853. Stove annual. (B. M. 4771.)

Exacum—*continued.*

E. zeylanicum (Ceylon).* *fl.* of a beautiful violet colour; petals five, obovate; racemes terminal and axillary, forming an expanded, terminal, corymb-formed panicle. September. *l.* nearly sessile, ovate-lanceolate, acuminated. Stem and branches tetragonal. *h.* 1ft. to 2ft. Ceylon, 1848. Stove annual. (B. M. 4423.)

EXALBUMINOUS. Without albumen.

EXCURRENT. Central, as the stem of a Fir, with branches disposed regularly round it.

EXITELIA. A synonym of **Parinaria** (which *see*).

EXOCHORDA (from *exo*, external, and *chorde*, a cord; the free placentary cords external to the carpels have suggested the name of the genus). ORD. *Rosaceæ*. Very handsome, hardy shrubs, remarkable for the structure of their fruits, which consist of five small, compressed, bony carpels, adhering round a central axis, in a star-like manner. The species described below thrives in any good garden soil. Propagated by seeds, by layers, or by suckers. The second species, *E. serratifolia*, also a native of China, is not yet introduced.

E. grandiflora (large-flowered).* *fl.* white, large, in axillary, elongated, few-flowered racemes; calyx bell-shaped; petals four or five, rounded; stamens fifteen, short. May. *fr.* small. *l.* petiolate, lanceolate-oblong, entire or serrulate, membranous. *h.* 6ft. North China. A very handsome plant. (G. C. n. s., xvi. 73; B. M. 4795, under name of *Spiræa grandiflora*.)

EXOGENS. *See* **Dicotyledons.**

EXOGONIUM. Included under **Ipomæa** (which *see*).

EXOSTEMMA (from *exo*, without, and *stemma*, a crown; stamens exserted). ORD. *Rubiaceæ*. A genus of about twenty species of stove, evergreen trees or shrubs, inhabiting tropical America and the West Indies. Flowers white, axillary and solitary, or disposed in terminal, few or many-flowered panicles; corolla with a long tube and a five-lobed, salver-shaped limb. Leaves ovate or lanceolate, stalked or sub-sessile. For culture, *see* **Cinchona.**

E. Caribæum (Caribbean). *fl.* white, about the length of the leaves, sweet-scented; pedicels axillary, one-flowered. June. *l.* ovate-lanceolate, acuminated. *h.* 20ft. West Indies, 1780.

E. longiflorum (long-flowered). *fl.* white, 5in. long before expansion; pedicels axillary, very short. June. *l.* linear-lanceolate, attenuated at both ends. *h.* 20ft. St. Domingo, 1820. (B. M. 4186.)

EXOTHOSTEMON. A synonym of **Prestonia** (which *see*).

EXOTIC. Introduced from other countries. Not native.

EXSERTED. Anthers are said to be Exserted when longer than the corolla, or even when longer than its tube, if the limb be very spreading.

EXSTIPULATE. Without stipules.

EXTRA-AXILLARY. Growing from above or below the axils of the leaves or branches.

EXTRORSE. Turned outwards from the axis of growth of the series of organs to which it belongs.

EYE. A horticultural term for a leaf-bud; also for the centre or the central markings of a flower.

EYEBRIGHT. *See* **Euphrasia.**

EYSENHARDTIA (named in honour of C. W. Eysenhardt, M.D., and professor in the University of Konigsberg, in Prussia). ORD. *Leguminosæ*. A genus containing a couple of species of half-hardy, evergreen shrubs, natives of Mexico and Texas. They thrive in a compost of loam and peat. Young cuttings will root in sandy soil, if inserted under a bell glass.

E. amorphoides (Amorpha-like). *fl.* pale yellow; racemes terminal, cylindrical. June. *l.* imparipinnate; leaflets numerous, stipellate, glandular *h.* 4ft. to 6ft. Mexico, 1838.

Sol.
135
4 vols
9145
635.03.